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ABSTRACT

This resource is designed to provide Ohio labor market information for use with advisory committees to stimulate and inform dialogue about the current evaluation and future planning of programs. It provides reports for 23 career fields in 6 career clusters. Each report highlights careers and occupations in the field and answers these questions: how many jobs; how fast employment will grow; how many job openings are expected; what education and training are required; how much the jobs pay; where the jobs are; and where more information can be found. The report concludes with data sources and descriptions of education and training levels. These career clusters (and career fields) are included: environmental and agricultural systems (horticulture; agricultural services and engineering, natural resources and environmental services); business and management (marketing; hospitality and tourism; food service; administrative support; finance, insurance, and real estate); health services (nursing and dietetics, health care technology, health care therapy); human resources/services (education and training services, legal and protective services); arts and communication (arts and entertainment, media and journalism); and industrial and engineering systems (auto and truck transport; transportation systems design and management; manufacturing engineering and technology; precision production; production maintenance setup and operation; engineering; architecture and drafting; construction). (YLB)

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OHIO CAREER RESOURCE

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Ohio is dedicated to providing quality programs and services to meet the lifelong career education needs of youth and adults, as well as the ever-changing demands of the present and future workplace. Ohio Career Resource provides information to assist educators, employers, and other decision-makers in developing programs that expand the career options of students while meeting employer needs. Ohio Career Resource describes labor market trends within Ohio's six career-technical clusters:

- Arts and Communications
- Business and Management
- Environmental and Agricultural Systems
- Health Services
- Human Resources/Services
- Industrial and Engineering Systems

Center for Curriculum & Assessment

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Using Ohio Career Resource

Why do you need Ohio Career Resource?

Over 5.8 million Ohioans are employed – roughly half of all men, women, and youth living in the state. Ohio's workers hold jobs in over 700 occupations, which are grouped into 51 career fields in Ohio's six career clusters.

Ohio Career-Technical and Adult Education (CTAE) has a tradition of providing leadership to help prepare youth and adults for careers – both right after high school and after college. In the 21st century, understanding where the jobs are, what education and training are required, how fast employment is growing, how many job openings there are, and how much the jobs pay are more critical than ever to the CTAE role, goals, and objectives. Focusing on roughly half of the 51 career fields, Ohio Career Resource is the starting point for understanding the labor market.

Labor market data – where the jobs are today and in the future – as well as individual student interest and desires must drive education and training programs. Aligned with the Ohio Department of Education (ODE) Mission to "Raise Expectations, Build Capacity, and Improve Results," CTAE has a responsibility to have programs that best meet the quality and quantity needs of business and industry, as well as the dreams of Ohio students.

How can you use Ohio Career Resource?

The Office of Career-Technical and Adult Education (CTAE), ODE, is providing labor market information to the state's 93 Career-Technical Planning Districts (CTPD) to assist with continuous improvement plans. The primary purpose is for use with advisory committees to stimulate and inform dialogue about the current evaluation and future planning of programs. The product is not designed for use as a marketing tool to recruit students into programs. The Ohio Career Information System, the Occupational Outlook Handbook, and other career resources are better suited to this purpose.

Limited quantities of the paper version of the data market information are available. These are also on the state education website.

Where are the jobs?
How fast will employment grow?
How much do the jobs pay?
What education and training are required?
How many job openings are expected?

For more information and technical assistance, contact the
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Using Ohio Career Resource

Discussion Questions

When assembling advisory councils of parents, teachers, business-industry representatives, and community leaders, consider using Ohio Career Resource reports to guide discussion with questions that include:

- After scanning the information for this career field, what additional information do we still need to guide local decisions about related programming, industry connections, and other issues?
- What related industries do we have in our area? What companies/businesses in our area have employees in this career field? What are the employment trends and who are the major employers? Has this industry changed in the past several years? How has modern technology impacted this industry? What are the future career/job prospects with this industry?
- How many students are currently enrolled in our CTAE adult and high school programs related to this career field? What has been the program enrollment growth pattern?
- What is our placement trend in both college, if related, and employment? How many of our former students are employed in our community? How many are employed elsewhere around the state and nation?
- What are the lifelong learning opportunities in this career field? What kinds of higher education partnerships do we have connected to these career fields? Are there others we should have?
- Does the current makeup of our advisory committee reflect what we need in this career field today? If not, who else needs to be part of this committee?
- What actions should we take to assure that our program content and delivery are meeting labor market needs?

What CTAE provides in 2001-2002

The Office of CTAE researched all 51career fields and selected 23 fields to help the CTPDs with labor market, data-driven programming. Ohio Career Resource provides reports for these 23 career fields:

Environmental and Agricultural Systems Career Cluster

- Horticulture
- Agricultural Services and Engineering
- Natural Resources and Environmental Services

Business and Management Career Cluster

- Marketing
- Hospitality and Tourism
- Food Service
- Administrative Support
- Finance, Insurance and Real Estate

Health Services Career Cluster

- Nursing and Dietetics
- Health Care Technology
- Health Care Therapy

Human Resources/Services Career Cluster

- Education and Training Services
- Legal and Protective Services

Arts and Communication Career Cluster

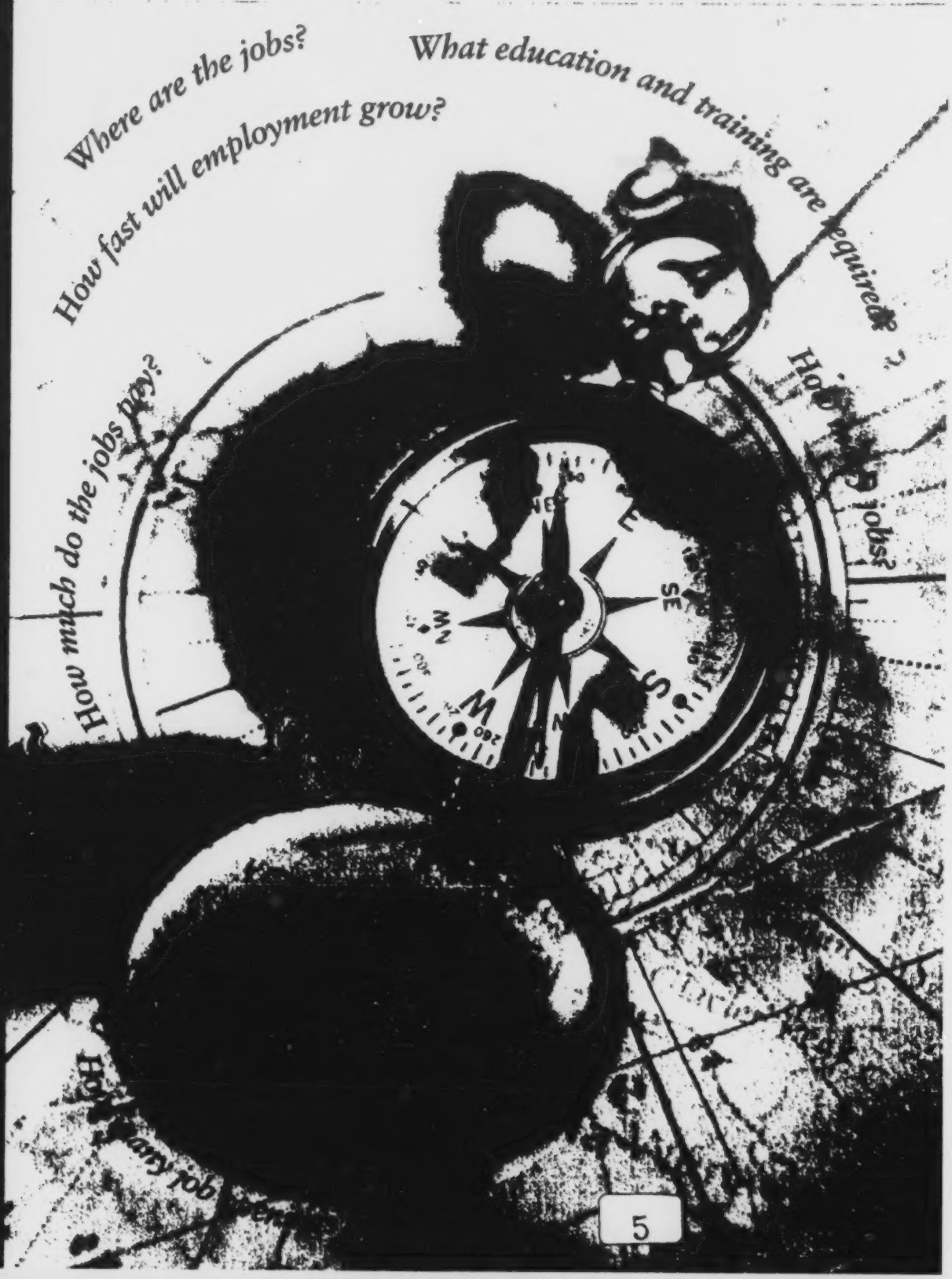
- Arts and Entertainment
- Media and Journalism

Industrial and Engineering Systems Career Cluster

- Transportation
  - -Auto and Truck Transport
  - -Transportation Systems Design and Management
- Manufacturing
  - -Manufacturing Engineering and Technology
  - -Precision Production
  - -Production Maintenance
- Construction
  - -Engineering
  - -Architecture and Drafting
  - -Construction

Environmental and Agricultural Career Cluster

Horticulture Careers


Where are the jobs?
How fast will employment grow?
What education and training are required?
How much do the jobs pay?
How many jobs?
How many jobs open?

Horticulture Careers

The Horticulture career field includes careers in landscaping and nurseries, and in such diverse occupations as landscape architects, laborers and managers. This is one of several Environmental and Agricultural career fields.

How many jobs?

In 1998, there were about 46,000 jobs in Ohio in the Horticulture career field. The largest occupation was landscaping and groundskeeping laborers with 37,340 jobs.

Horticulture Occupations Ranked by Employment

Occupation	1998 Employment
Landscaping and Groundskeeping Laborers	37,340
Lawn Service Managers	3,720
Pruners	2,120
Landscape Architects	1,330
Sprayers and Applicators	1,260
Nursery and Greenhouse Managers	130

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 22.6 percent, faster than the projected average rate of 12.5 percent for all occupations in the state. One occupation that will grow much faster than average is lawn service manager, which has a projected 31.2 percent job growth rate. Other occupations which will see a growth rate of about double the average are pruners, nursery and greenhouse managers, and sprayers and applicators.

Horticulture Occupations Ranked by Job Growth Rate, 1998-2008

Occupation	Job Growth Rate
Lawn Service Managers	31.2%
Pruners	26.4%
Nursery and Greenhouse Managers	23.1%
Sprayers and Applicators	22.2%
Landscaping and Groundskeeping Laborers	21.9%
Landscape Architects	13.5%

How many job openings are expected?

Occupations in the Horticulture career field will generate more than 23,000 job openings over the decade, including more than 10,000 new jobs. The remaining openings will be replacements for current workers.

Fast rates of growth do not necessarily indicate a large number of job openings. For instance, while the occupation of lawn service manager has a 31.2 percent job growth rate, leading the Horticulture career field, it will account for only 6 percent of the job openings expected over the decade in the field, or 1,460 openings. By contrast, landscaping and groundskeeping laborers will provide a total of 19,310 openings, or nearly 84 percent of all openings expected for the Horticulture career field.

Horticulture Occupations Ranked by Total Job Openings, 1998-2008

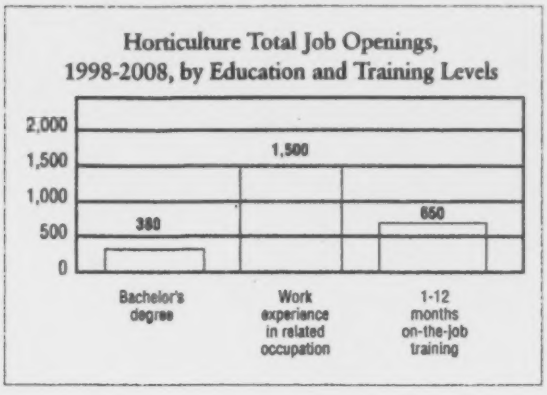
Occupation	Total Job Openings
Landscaping and Groundskeeping Laborers	19,310
Lawn Service Managers	1,460
Pruners	1,190
Landscape Architects	380
Sprayers and Applicators	650
Nursery and Greenhouse Managers	40

What education and training are required?

About 1,500 openings are expected over the 1998-2008 decade in occupations requiring work experience in related occupations, for nursery, greenhouse and lawn service managers. Over the same period, the occupation requiring a bachelor's degree - landscape architects – will comprise about 380 job openings.

The occupation calling for one to 12 months of training and experience, sprayers and applicators, will provide about 650 job openings during the decade.

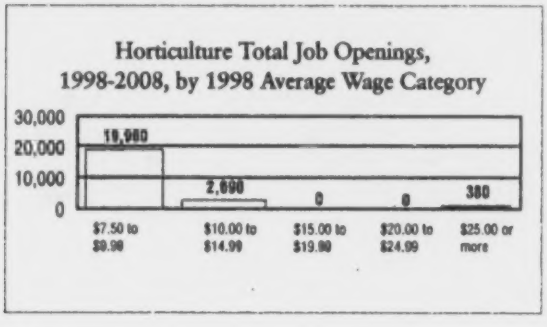
In addition, there will be large numbers of openings for entry-level occupations requiring little training. These openings will be for pruners, and landscaping and groundskeeping laborers.



How much do the jobs pay?

The largest number of job openings in the Horticulture career field will be in occupations with average hourly wages of $7.50 to $9.99 in 1998. The majority of the 19,960 openings are for landscaping and groundskeeping laborers, sprayers and applicators. An additional 2,690 openings will be in occupations with average hourly wages of $10 to $14.99. Most of these openings are for pruners, and lawn service, nursery and greenhouse managers.

In the occupation with 1998 average hourly wages of $25 or more, 380 openings are expected for landscape architects.



Where are the jobs?

Most jobs related to the Horticulture career field are found in:

Landscape and Horticultural Services — businesses that provide landscape planning and architectural services, and lawn and garden services.

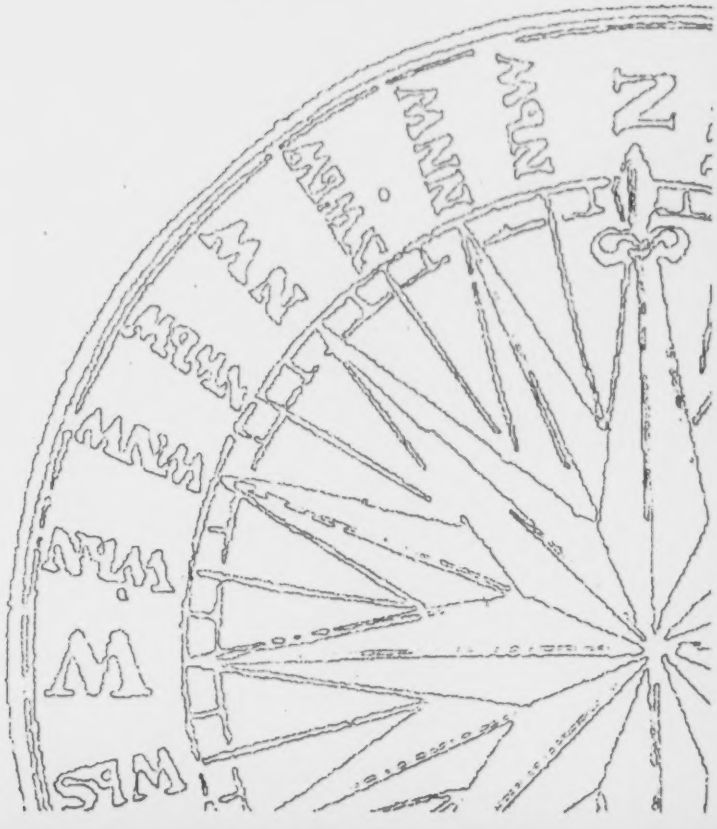
Retail Nurseries, Lawn and Garden Supply Store — businesses that sell plants, seeds, and lawn and garden supplies and equipment to the general public.

Wholesale and Retail Florists — businesses that sell flowers, nursery stock and florists' supplies.

Where can I find more information?

Ohio's labor market information system at **lmi.state.oh.us** and the Occupational Outlook Handbook at **stats.bls.gov/ocohome.htm** are sources of additional information and links to Ohio and national job banks, career and occupational resources, and education and training opportunities.

Check the Web site at **www.ode.state.oh.us/ctae** for more details about this and other career fields.



Horticulture Careers

Data sources

Employment and wage information are from the Ohio Department of Job and Family Services, Bureau of Labor Market Information.

Education and training levels, from the U.S. Bureau of Labor Statistics, are described as:

Beyond bachelor's degree — This category includes professional, doctoral and master's degrees. Completion of academic programs leading to first professional degrees usually requires at least six years of full-time equivalent academic study, including college study prior to entering the professional degree program. Completion of doctoral degrees usually requires at least three years of full-time equivalent academic work beyond the bachelor's degree. Master's degrees usually require one or two years of full-time equivalent study beyond the bachelor's degree.

Work experience, plus a bachelor's or higher degree — Most occupations in this category are managerial occupations that require experience in a related nonmanagerial position.

Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

Associate degree — Completion of the degree program usually requires at least two years of full-time equivalent academic study.

Postsecondary vocational training — Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.

Work experience in a related occupation — Occupations requiring work experience include some supervisory or managerial jobs.

Apprenticeship or more than one year training and work experience — Some occupations generally require more than 12 months of on-the-job training, or combined work experience and formal classroom instruction, for workers to develop the skills needed for average job performance. This category includes formal and informal apprenticeships that may last up to four years and short-term intensive employer-sponsored training that workers must successfully complete. Individuals undergoing training are generally considered to be employed in the occupation. This category includes occupations in which workers may gain experience in non-work activities, such as professional athletes who gain experience through participation in athletic programs in academic institutions.

1 to 12 months training and work experience — This category pertains to occupations in which workers can develop the skills needed for average job performance after 1 to 12 months of combined on-the-job experience and informal training.

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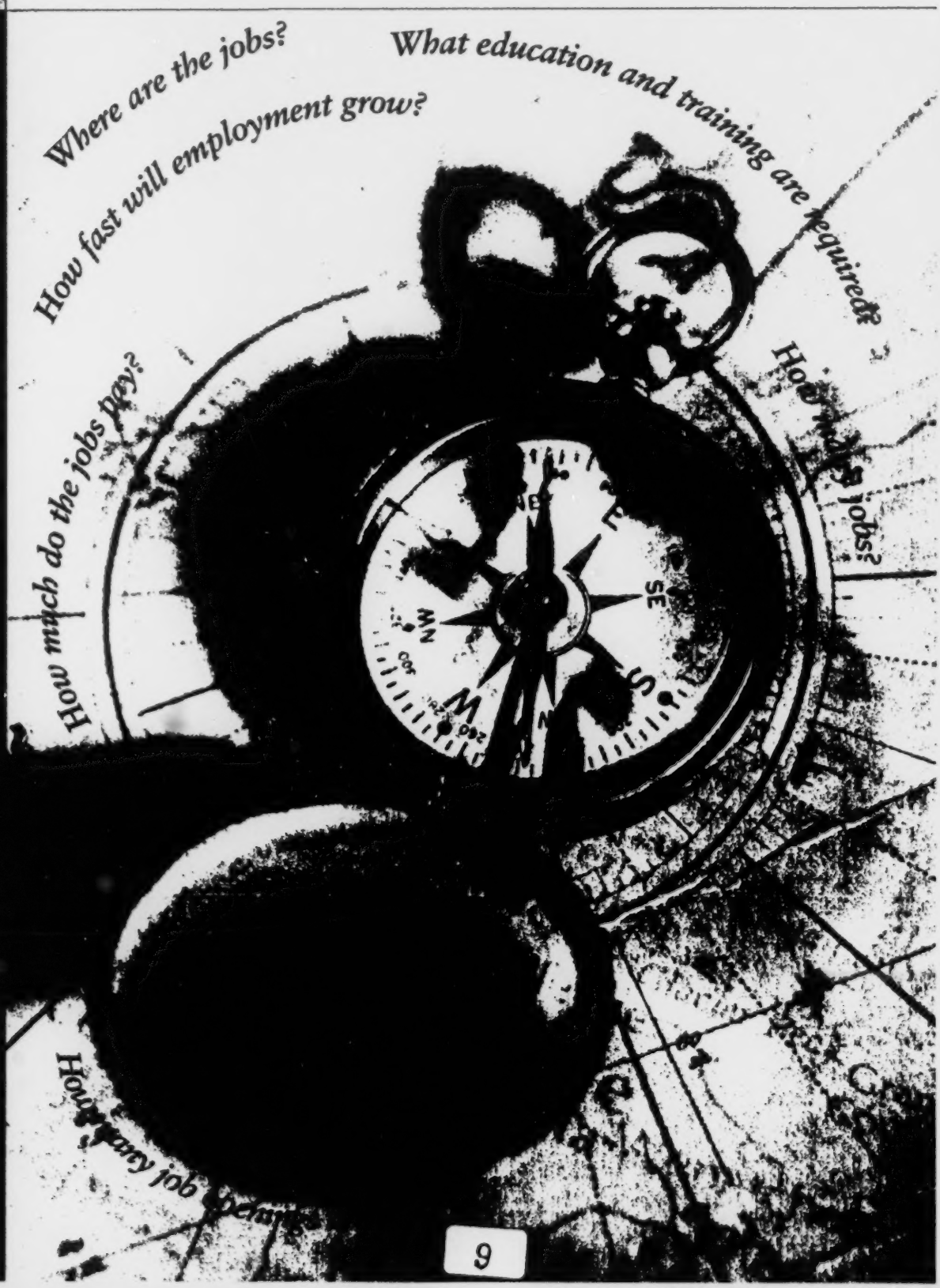
Environmental and Agricultural Career Cluster

Agricultural Services and Engineering Careers


Where are the jobs?
How fast will employment grow?
What education and training are required?
How much do the jobs pay?
How many jobs?
How many job openings?

Agricultural Services and Engineering Careers

The Agricultural Services and Engineering career field includes careers as engineering technicians, construction managers, representatives selling scientific products such as agricultural chemicals, veterinarians and veterinary inspectors, farm and heavy equipment mechanics and their supervisors, and a variety of other professional, paraprofessional and technical workers. This is one of several Environmental and Agricultural career fields.

How many jobs?

In 1998, there were about 112,000 jobs in Ohio in the Agricultural Services and Engineering career field. The largest occupations range from 27,590 jobs for professional, paraprofessional and technical workers, to about 2,000 jobs for veterinarians and veterinary inspectors.

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 13.4 percent, close to the projected average rate of 12.5 percent for all occupations in the state. The 10 fastest-growing occupations in Agricultural Services and Engineering include two that are expected to grow at nearly double the rate for all occupations: veterinary assistants, and veterinarians and veterinary inspectors. Other occupations expected to grow faster than average include animal caretakers, construction managers, some engineering technicians, and other professional, paraprofessional and technical workers. At the same time, the occupations of animal trainers, aircraft pilots, flight engineers, and veterinary technicians and technologists are projected to grow at about the average rate.

Ten Largest Agricultural Services and Engineering Occupations

	Occupation	1998 Employment
1.	All Other Professional, Paraprofessional and Technical Workers	27,590
2.	Scientific Products Sales Representatives, Except Retail	23,730
3.	First-Line Supervisors of Mechanics and Repairers	17,940
4.	All Other Engineering Technicians	9,960
5.	Construction Managers	9,510
6.	Animal Caretakers, Except Farm	4,800
7.	Mechanical Engineering Technicians	4,790
8.	Mobile Heavy Equipment Mechanics	3,390
9.	Aircraft Pilots and Flight Engineers	2,650
10.	Veterinarians and Veterinary Inspectors	2,040

Ten Fastest-Growing Agricultural Services and Engineering Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Veterinary Assistants	23.8%
2.	Veterinarians and Veterinary Inspectors	22.1%
3.	Animal Caretakers, Except Farm	19.8%
4.	All Other Professional, Paraprofessional and Technical Workers	18.2%
5.	Construction Managers	15.7%
6.	All Other Engineering Technicians	13.7%
7.	Animal Trainers	12.5%
8.	Aircraft Pilots and Flight Engineers	12.5%
9.	Veterinary Technicians and Technologists	12.0%
10.	Scientific Products Sales Representatives, Except Retail	10.8%

Ten Agricultural Services and Engineering Occupations With the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	All Other Professional, Paraprofessional and Technical Workers	11,680
2.	Scientific Products Sales Representatives, Except Retail	8,360
3.	First-Line Supervisors of Mechanics and Repairers	6,900
4.	All Other Engineering Technician	3,940
5.	Construction Managers	3,160
6.	Animal Caretakers, Except Farm	1,640
7.	Mechanical Engineering Technicians	1,460
8.	Mobile Heavy Equipment Mechanics	1,220
9.	Aircraft Pilots and Flight Engineers	910
10.	Veterinarians and Veterinary Inspectors	870

How many job openings are expected?

Occupations in the Agricultural Services and Engineering career field will generate nearly 42,000 job openings over the decade. These openings will result in part from the creation of about 15,000 new jobs. The remainder will be replacements for current workers.

Fast rates of growth do not necessarily correspond with the greatest number of job openings. For instance, in the Agricultural Services and Engineering career field, the 10 fastest-growing occupations account for more than 75 percent of the projected openings for the decade.

However, when the occupations are ranked strictly by total number of job openings expected from 1998 to 2008, a slightly different list results. The top 10 occupations account for more than 40,000 job openings, or 95.5 percent of the total number of openings in the field.

What education and training are required?

Occupations in the Agricultural Services and Engineering career field cover a wide range of education and training levels, with about one-half requiring at least an associate degree. The largest number of openings, 15,990, is for occupations requiring a bachelor's degree. These openings are primarily for professional, paraprofessional and technical workers, construction managers, agricultural purchasing agents and buyers, and aircraft pilots and flight engineers.

The next largest number of openings is 8,360, for occupations requiring one to 12 months training and work experience.

Most of the openings will be for scientific products sales representatives.

Occupations requiring work experience in a related occupation will account for about 7,000 job openings, primarily for first-line supervisors of mechanics and repairers. Close behind are occupations requiring an associate degree, which will provide about 5,800 job openings, mostly as engineering technicians.

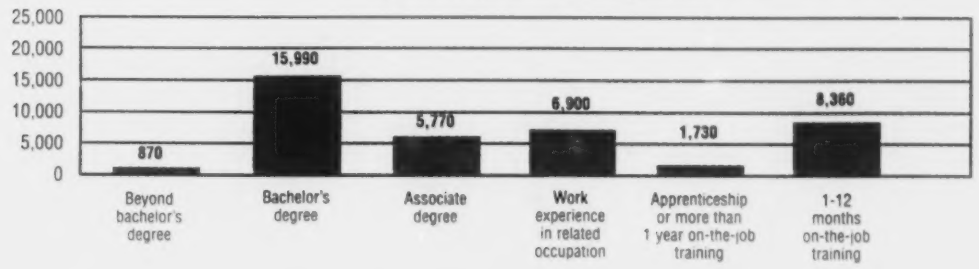
How much do the jobs pay?

The largest number of job openings in the Agricultural Services and Engineering career field will be in occupations with 1998 average hourly wages of $20 to $24.99. The majority of the 18,420 job openings will be as scientific products sales representatives, first-line supervisors of mechanics and repairers, and construction managers.

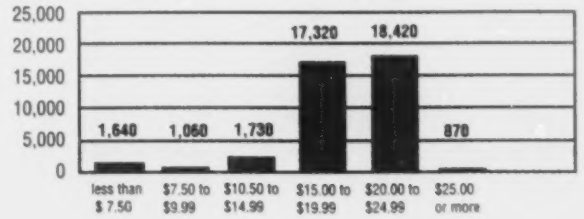
An additional 17,320 openings will be available in occupations with 1998 average wages of $15 to $19.99 per hour. Most of these openings are for engineering technicians, and certain professional, paraprofessional and technical workers.

About 1,700 openings are projected for occupations with average wages of $10 to $14.99 per hour. The large majority of the openings are for mobile heavy equipment mechanics, with some jobs for farm equipment mechanics and animal trainers.

Agricultural Services and Engineering Job Openings, 1998-2008, by Education and Training Levels



Agricultural Services and Engineering Total Job Openings, 1998-2008, by 1998 Average Wage Category



Where are the jobs?

Most jobs related to the Agricultural Services and Engineering Career Field are found in:

Wholesale and Retail Groceries, Fruit and Vegetable Markets, and Meat and Fish Markets — businesses that distribute and sell food and other grocery products.

Wholesale and Retail Farm and Garden Supplies and Equipment — businesses that distribute and sell farm supplies and equipment.

Nonresidential Construction — businesses that construct nonresidential buildings, including farm buildings.

Veterinary and Other Animal Services — businesses that provide veterinary services and other animal services such as boarding, breeding and artificial insemination, grooming, training, and pedigree record services.

Where can I find more information?

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Agricultural Services and Engineering Careers

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Associate degree — Completion of the degree program usually requires at least two years of full-time equivalent academic study.

Postsecondary vocational training — Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.

Work experience in a related occupation — Occupations requiring work experience include some supervisory or managerial jobs.

Apprenticeship or more than one year training and work experience — Some occupations generally require more than 12 months of on-the-job training, or combined work experience and formal classroom instruction, for workers to develop the skills needed for average job performance. This category includes formal and informal apprenticeships that may last up to four years and short-term intensive employer-sponsored training that workers must successfully complete. Individuals undergoing training are generally considered to be employed in the occupation. This category includes occupations in which workers may gain experience in non-work activities, such as professional athletes who gain experience through participation in athletic programs in academic institutions.

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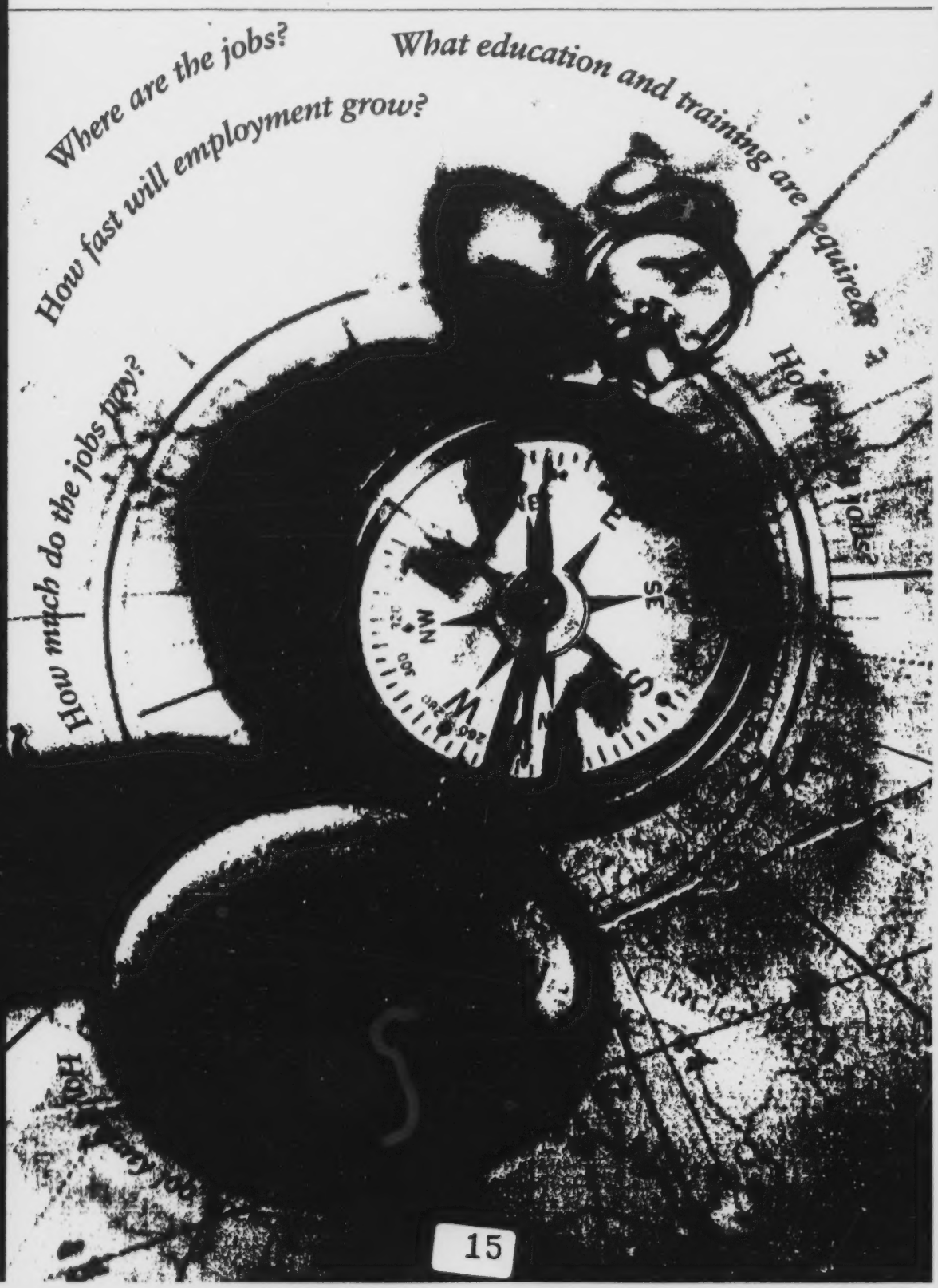
Natural Resources and Environmental Services Careers



Natural Resources and Environmental Services Careers

The Natural Resources and Environmental Services career field includes careers in forestry, logging and lumber, parks and wildlife management, conservation, sanitation, and environmental protection. This is one of several Environmental and Agricultural career fields.

How many jobs?

In 1998, there were about 37,800 jobs in Ohio in the Natural Resources and Environmental Services career field. The largest occupations range from 8,730 jobs for inspectors and compliance officers to 1,110 jobs for certain precision woodworkers.

Ten Largest Natural Resources and Environmental Services Occupations

	Occupation	1998 Employment
1.	Inspectors and Compliance Officers	8,730
2.	Communication, Transportation and Utility Managers	7,100
3.	Water and Waste Treatment Plant Operators	4,510
4.	Refuse and Recyclable Material Collectors	2,590
5.	Woodworking Mach Operators and Tenders, Except Sawing	2,100
6.	Water and Power Machinery Mechanics	2,010
7.	Wood Machinists	1,510
8.	Pest Controllers and Assistants	1,190
9.	Sawing Machine Operators and Tenders	1,120
10.	All Other Precision Woodworkers	1,110

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 7.5 percent, more slowly than the projected average rate of 12.5 percent for all occupations in the state. The 10 fastest-growing occupations in Natural Resources and Environmental Services include one that is expected to grow at more than triple the rate for all occupations: postsecondary parks and recreation and fitness teachers. Other occupations expected to grow faster than average include pest controllers, foresters and conservation scientists, wood machinists, and persons who service septic tanks and clean sewer tanks.

At the same time, the occupations of communication, transportation and utility managers, woodworking machine setters and some precision woodworkers are projected to grow at about the average rate.

Ten Fastest-Growing Natural Resources and Environmental Services Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Parks and Recreation and Fitness Teachers, Postsecondary	43.6%
2.	Pest Controllers and Assistants	26.1%
3.	Foresters and Conservation Scientists	18.1%
4.	Wood Machinists	17.2%
5.	Septic Tank Servicers and Sewer Tank Cleaners	15.8%
6.	All Other Precision Woodworkers	14.4%
7.	Communication, Transportation and Utility Managers	13.2%
8.	Woodworking Machine Setters, Except Sawing	11.3%
9.	Water and Waste Treatment Plant Operators	8.4%
10.	Sawing Machine Setters and Operators	8.3%

How many job openings are expected?

Occupations in the Natural Resources and Environmental career field will generate nearly 11,500 job openings over the decade. About 2,850 of these openings will be new jobs, with the remainder resulting from the need to replace current workers.

Fast rates of growth do not necessarily correspond with the greatest number of job openings. For instance, in the Natural Resources and Environmental Services career field, the 10 fastest-growing occupations account for

about 53 percent of the projected openings for the decade.

However, when the occupations are ranked strictly by total number of job openings expected from 1998 to 2008, a slightly different list results. The 10 occupations with the most openings account for more than 9,600 job openings, or nearly 84 percent of the total number of openings in the field.

Natural Resources and Environmental Services Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	Inspectors and Compliance Officers	2,300
2.	Communication, Transportation and Utility Managers	2,180
3.	Water and Waste Treatment Plant Operators	1,430
4.	Refuse and Recyclable Material Collectors	1,000
5.	Pest Controllers and Assistants	580
6.	Woodworking Machine Operators and Tenders, Except Sawing	490
7.	Water and Power Machinery Mechanics	450
8.	Wood Machinists	430
9.	All Other Precision Woodworkers	430
10.	Sawing Machine Operators and Tenders	330

What education and training are required?

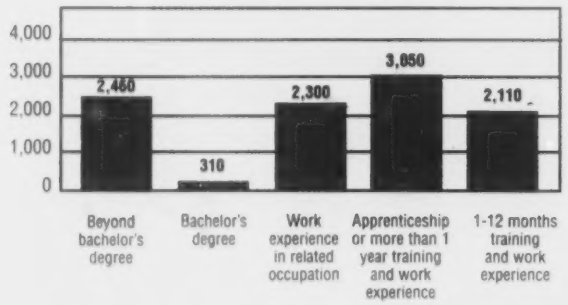
Occupations in the Natural Resources and Environmental Services career field cover a wide range of education and training levels. The largest number of openings, 3,050, is for occupations requiring an apprenticeship or more than one year of training and work experience. These openings are primarily for operators of water and waste treatment plants, water and power machinery mechanics, wood machinists, and certain precision woodworkers.

The next largest number of openings is 2,460, for occupations requiring education beyond a bachelor's degree. Most of the openings will be for communication, transportation and utility managers.

One occupation requiring work experience in a related occupation, inspectors and compliance officers, will account for about 2,300 job openings. Close behind are occupations requiring one to 12 months of training and work experience, which will provide about 2,110 job openings, mostly as pest controllers and their assistants, woodworking and sawing machine operators and tenders, and woodworking machine setters.

The occupation of foresters and conservation scientists requires a bachelor's degree; it will provide 310 openings over the decade.

Natural Resources and Environmental Services Total Job Openings, 1998-2008, by Education and Training Level



How much do the jobs pay?

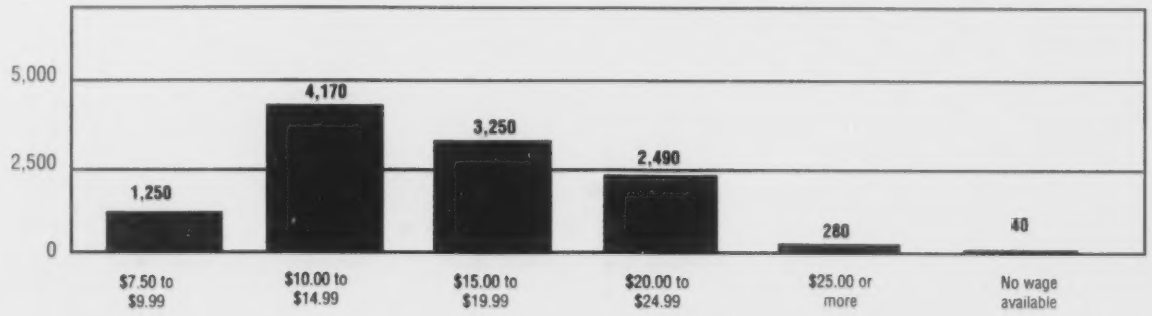
The largest number of job openings in the Natural Resources and Environmental Services career field will be in occupations with 1998 average hourly wages of $10 to $14.99. The majority of the 4,170 job openings will be as water and waste treatment plant operators, refuse and recyclable material collectors, pest controllers and their assistants, and wood machinists.

An additional 3,250 openings will be available in occupations with 1998 average wages of $15 to $19.99 per hour. Most of these openings are for inspectors and compliance officers, and water and power machinery mechanics.

About 2,490 openings are projected for occupations with average wages of $20 to $24.99 per hour in 1998. The large majority of the openings are for communication, transportation and utility managers.

Another 1,250 openings will exist in occupations with 1998 average wages of $7.50 to $9.99. These openings are almost evenly divided among three occupations: woodworking machine operators and tenders, other precision woodworkers, and sawing machine operators and tenders.

Natural Resources and Environmental Services Total Job Openings, 1998-2008, by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Natural Resources and Environmental Services career field are found in:

Water and Sanitary Services — businesses and public agencies that provide water for domestic, commercial or industrial use, and refuse collection and sewer services.

Lumber and Wood Products — businesses that cut timber, operate saw and planning mills, and manufacture wood products.

Federal and State Government — public agencies including the U.S. and Ohio Environmental Protection Agencies, the U.S. Department of the Interior, and the Ohio Department of Natural Resources.

Where can I find more information?

Ohio's labor market information system at **lmi.state.oh.us** and the Occupational Outlook Handbook at **stats.bls.gov/ocohome.htm** are sources of additional information and links to Ohio and national job banks, career and occupational resources, and education and training opportunities.

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Natural Resources and Environmental Services Careers

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Work experience, plus a bachelor's or higher degree — Most occupations in this category are managerial occupations that require experience in a related nonmanagerial position.

Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

Associate degree — Completion of the degree program usually requires at least two years of full-time equivalent academic study.

Postsecondary vocational training — Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.

Work experience in a related occupation — Occupations requiring work experience include some supervisory or managerial jobs.

Apprenticeship or more than one year training and work experience — Some occupations generally require more than 12 months of on-the-job training, or combined work experience and formal classroom instruction, for workers to develop the skills needed for average job performance. This category includes formal and informal apprenticeships that may last up to four years and short-term intensive employer-sponsored training that workers must successfully complete. Individuals undergoing training are generally considered to be employed in the occupation. This category includes occupations in which workers may gain experience in non-work activities, such as professional athletes who gain experience through participation in athletic programs in academic institutions.

1 to 12 months training and work experience — This category pertains to occupations in which workers can develop the skills needed for average job performance after 1 to 12 months of combined on-the-job experience and informal training.

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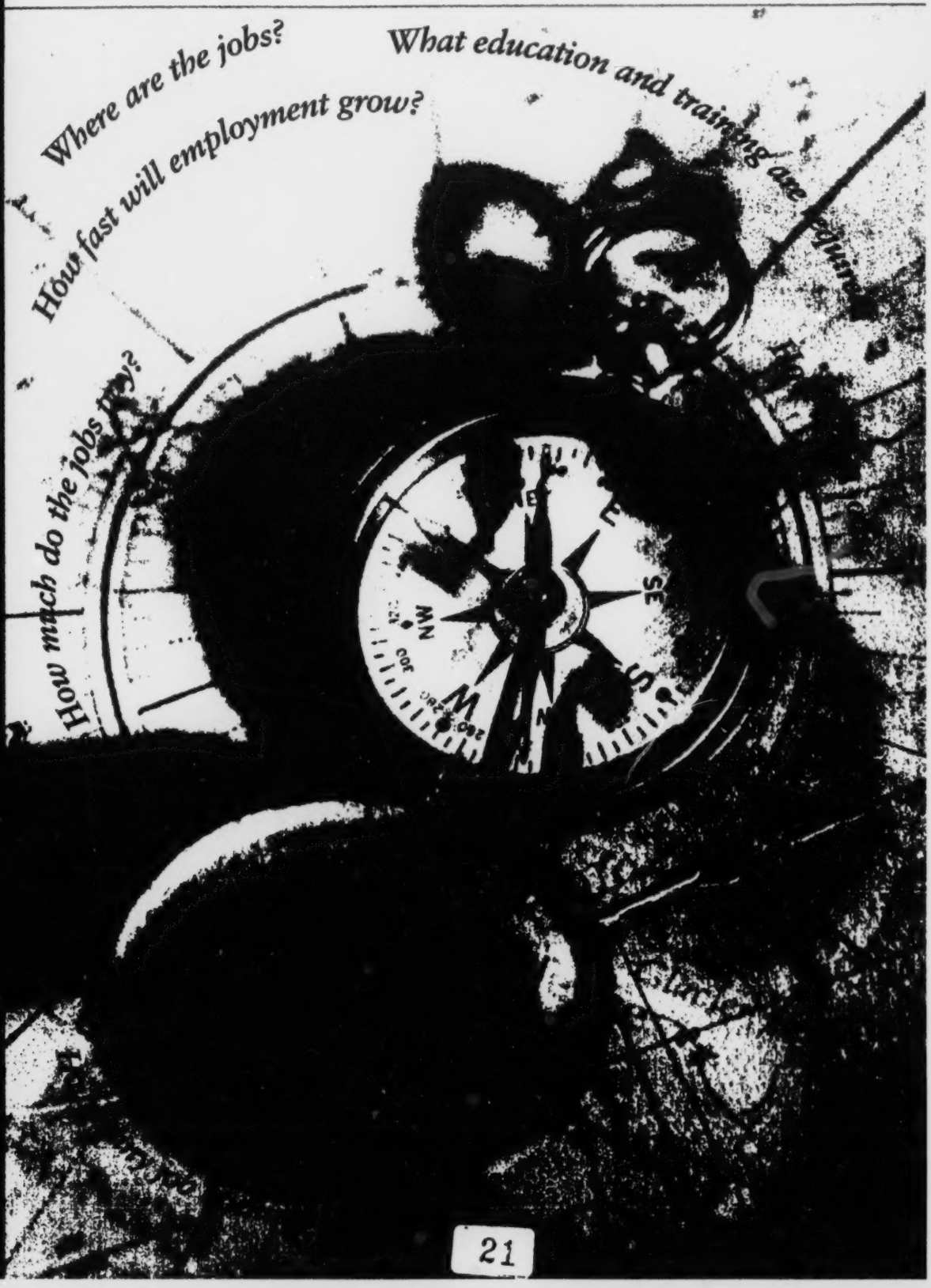
Business and Management Career Cluster

Marketing Careers



Marketing Careers

The Marketing career field includes careers in sales, public relations, and advertising. This is one of several career fields in Business and Management.

How many jobs?

In 1998, there were about 737,000 jobs in Ohio in the Marketing career field. The largest occupations range from nearly 168,700 jobs for retail salespersons to about 19,500 jobs for order clerks.

Ten Largest Marketing Occupations

	Occupation	1998 Employment
1.	Retail Salespersons	168,680
2.	Cashiers	123,440
3.	Marketing and Sales Supervisors	107,360
4.	Sales Floor Stock Clerks	66,400
5.	Sales Representatives, Excluding Scientific and Retail Products	54,620
6.	All Other Sales and Related Occupations	23,910
7.	Sales Representatives, Scientific Products, Excluding Retail	23,730
8.	Telemarketers, Solicitors, Door-To-Door Sales Workers	22,620
9.	Marketing, Advertising and Public Relations Managers	20,640
10.	Order Clerks, Materials or Services	19,490

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 12.2 percent, about the same as the average rate of 12.5 percent projected for all occupations in the state.

The 10 fastest-growing occupations in the Marketing career field include three occupations with job growth at about twice or three times the average rate: telemarketers, business services sales agents, and all other service sales occupations. The remaining fastest-growing occupations are expected to grow at above average rates.

Ten Fastest-Growing Marketing Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Telemarketers, Solicitors, and Door-To-Door Sales Workers	39.6%
2.	Business Services Sales Agents	37.6%
3.	All Other Service Sales Occupations	24.5%
4.	Utilities Customer Service Representatives	21.9%
5.	Counter and Rental Clerks	21.6%
6.	Demonstrators and Product Promoters	20.2%
7.	Public Relations Specialists	20.1%
8.	Marketing, Advertising and Public Relations Managers	17.5%
9.	Advertising Sales Agents	16.3%
10.	Retail Salespersons	14.6%

How many job openings are expected?

Occupations in the Marketing career field will add more than 90,000 new jobs, and generate about 296,000 job openings over the decade. These job openings will result from the creation of new jobs and the need to replace current workers.

Fast growth rates do not necessarily indicate a large number of job openings. Altogether, the 10 fastest-growing occupations account for 45 percent of the job openings expected over the decade in the career field, or about 134,000 openings.

Over the same time period, the 10 occupations expected to have the most job openings will provide a total of about 258,000 openings, or 87 percent of all openings expected for the Marketing career field.

Two occupations are expected to have more than 70,000 openings: retail salespersons and cashiers. The remaining occupations will provide between 6,900 and 25,000 openings each.

Ten Marketing Occupations with the Most Job Openings, 1998-2008

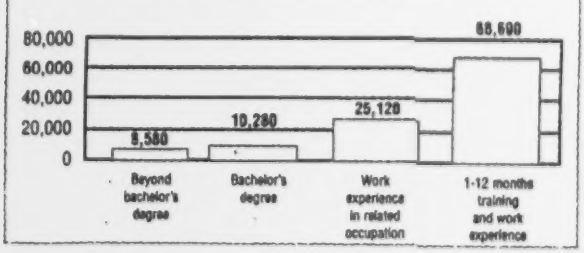
	Occupation	Total Job Openings
1.	Retail Salespersons	81,790
2.	Cashiers	71,010
3.	Marketing and Sales Supervisors	25,120
4.	Sales Reps, Except Scientific and Retail	17,670
5.	Telemarketers, Solicitors, and Door-To-Door Sales Workers	14,780
6.	Counter and Rental Clerks	12,060
7.	All Other Sales and Related Occupations	10,190
8.	Sales Floor Stock Clerks	10,020
9.	Sales Representatives, Scientific Products, Excluding Retail	8,360
10.	Business Services Sales Agents	6,900

What education and training are required?

Occupations in the Marketing career field require various education and training levels. Occupations requiring one to 12 months of training and work experience will provide about 69,000 openings over the decade. Most of these openings will be for sales representatives, telemarketers, and all other sales and related occupations.

An additional 25,000 openings will occur in occupations requiring work experience in a related occupation. These openings are for marketing and sales supervisors. Nearly 19,000 openings are expected in occupations requiring a bachelor's or higher degree, primarily in marketing and public relations management, purchasing, and public relations specialties. There will also be large numbers of openings for occupations requiring only brief training. Most of these openings will be for retail salespersons and cashiers.

Marketing Total Job Openings, 1998-2008, by Education and Training Level



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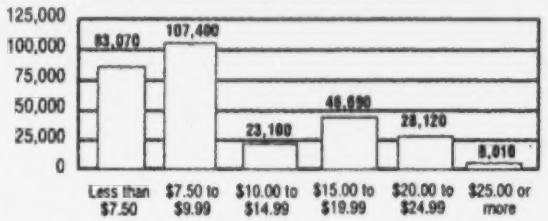

How much do the jobs pay?

The largest number of job openings in the Marketing career field will be in occupations with average hourly wages of $7.50 to $9.99 in 1998. The majority of these 107,400 openings are for retail salespersons and telemarketers. An additional 83,000 openings will be available in occupations with 1998 average wages of less than $7.50 per hour. Most of these openings are for cashiers.

Nearly 47,000 openings are projected for occupations with 1998 average hourly wages of $15 to $19.99, primarily for marketing and sales supervisors. About 28,000 openings will be available for occupations in the $20 to $24.99 range in 1998, mostly for sales representatives. There will also be more than 8,000 openings, primarily for marketing and public relations managers, with 1998 average hourly wages of $25 or more.

Where are the jobs?

Most jobs related to the Marketing career field are found in:
Wholesale Trade — businesses that sell merchandise primarily to other businesses.
Retail Trade — businesses that sell merchandise primarily for personal or household use.

Where can I find more information?

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Marketing Careers

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Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

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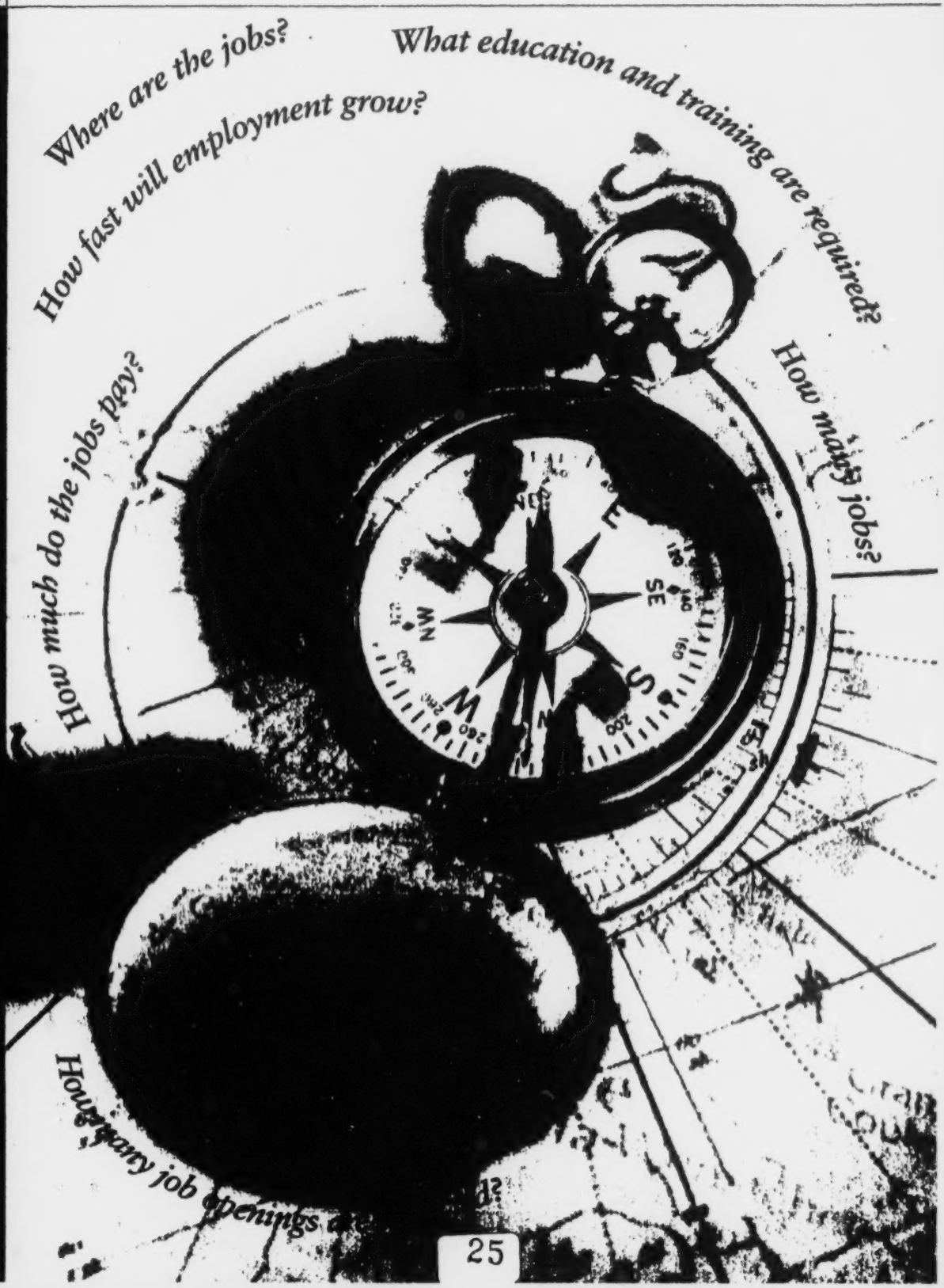
Business and Management Career Cluster

Hospitality and Tourism Careers


Where are the jobs?
What education and training are required?
How fast will employment grow?
How much do the jobs pay?
How many jobs?
How many job openings a

Hospitality and Tourism Careers

The Hospitality and Tourism career field includes careers in the travel industry, hotels and motels, and in amusement and recreation. This is one of several career fields in Business and Management.

How many jobs?

In 1998, there were about 90,500 jobs in Ohio in the Hospitality and Tourism career field. The largest occupations range from 31,750 jobs for maids to about 3,000 jobs for institutional cleaning supervisors.

Ten Largest Hospitality and Tourism Occupations

	Occupation	1998 Employment
1.	Maids and Housekeeping Cleaners	31,750
2.	Recreation Workers	12,320
3.	All Other Service Workers	10,480
4.	Amusement and Recreation Attendants	9,040
5.	Hotel, Motel and Resort Desk Clerks	4,650
6.	Travel Agents	4,200
7.	Reservation and Transportation Ticket Agents	3,550
8.	Parking Lot Attendants	3,420
9.	Ushers, Lobby Attendants and Ticket Takers	3,420
10.	Institutional Cleaning Supervisors	2,950

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 15.1 percent, faster than the average rate of 12.5 percent projected for all occupations in the state.

The 10 fastest-growing occupations in the Hospitality and Tourism career field include six occupations with job growth at about twice to three times the average rate: postsecondary parks, recreation and fitness teachers; parking lot attendants; flight attendants; guides; amusement and recreation attendants; and travel agents.

The remaining fastest-growing occupations are expected to grow at above average rates.

Ten Fastest-Growing Hospitality and Tourism Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Parks, Recreation and Fitness Teachers, Postsecondary	43.6%
2.	Parking Lot Attendants	32.7%
3.	Flight Attendants	31.9%
4.	Guides	28.3%
5.	Amusement and Recreation Attendants	26.1%
6.	Travel Agents	24.3%
7.	Ushers, Lobby Attendants and Ticket Takers	15.2%
8.	Recreation Workers	14.6%
9.	Baggage Porters and Bellhops	13.6%
10.	All Other Service Workers	12.8%

How many job openings are expected?

Occupations in the Hospitality and Tourism career field will generate nearly 34,000 job openings over the decade. These job openings will result in part from the creation of about 13,700 new jobs. The remainder will be replacements for current workers.

Fast growth rates do not necessarily indicate a large number of job openings. Altogether, the 10 fastest-growing occupations account for 58 percent of the job openings expected over the decade in the career field, or about 19,600 openings.

However, the 10 occupations expected to have the most job openings will provide a total of nearly 32,000 openings, or 94.3 percent of all openings expected for the Hospitality and Tourism career field.

The occupations expected to have the most job openings include maids and recreation workers.

Ten Hospitality and Tourism Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	Maids and Housekeeping Cleaners	9,780
2.	Recreation Workers	5,060
3.	All Other Service Workers	4,290
4.	Amusement and Recreation Attendants	4,010
5.	Hotel, Motel and Resort Desk Clerks	2,260
6.	Travel Agents	1,900
7.	Parking Lot Attendants	1,720
8.	Ushers, Lobby Attendants and Ticket Takers	1,150
9.	Institutional Cleaning Supervisors	860
10.	Reservation and Transportation Ticket Agents	840

What education and training are required?

Occupations in the Hospitality and Tourism career field require various education and training levels. About 5,300 openings will be in occupations requiring a bachelor's or higher degree. These openings are primarily for recreation workers, and postsecondary parks, recreation and fitness teachers.

An additional 1,900 openings will occur in the occupation of travel agents, which requires postsecondary vocational training.

There also will be large numbers of openings in occupations requiring only brief training. Most ofthese openings will be for maids and other service workers, amusement and recreation attendants, and hotel and motel desk clerks.

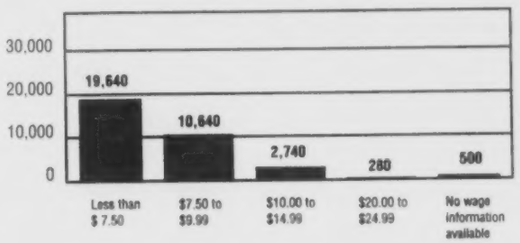
How much do the jobs pay?

The largest number of job openings in the Hospitality and Tourism career field will be in occupations with average hourly wages of less than $7.50 in 1998. The majority of these 19,640 openings are for maids, and amusement and recreation attendants.

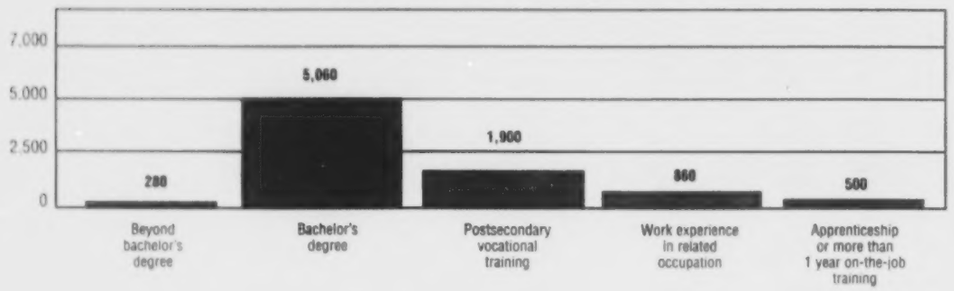
An additional 10,640 openings will be available in occupations with 1998 average hourly wages of $7.50 to $9.99. Most of these openings are for recreation and all other service workers.

About 2,700 job openings are projected for occupations with 1998 average hourly wages of $10 to $14.99. These openings are primarily for travel agents. About 280 openings are expected for postsecondary parks, recreation and fitness teachers, an occupation with average wages of more than $25 per hour in 1998.

Hospitality and Tourism Total Job Openings, 1998-2008, by 1998 Average Wage Category



Hospitality and Tourism Total Job Openings, 1998-2008, by Education and Training Levels



Where are the jobs?

Most jobs in the Hospitality and Tourism career field are found in hotels and motels, as travel agents and tour guides and operators, and in amusement and recreation services, including organizations such as theaters, dance studios and orchestras, commercial sports, physical fitness facilities, public golf courses, amusement parks, membership sport and recreation clubs, and ticket sales offices.

Where can I find more information?

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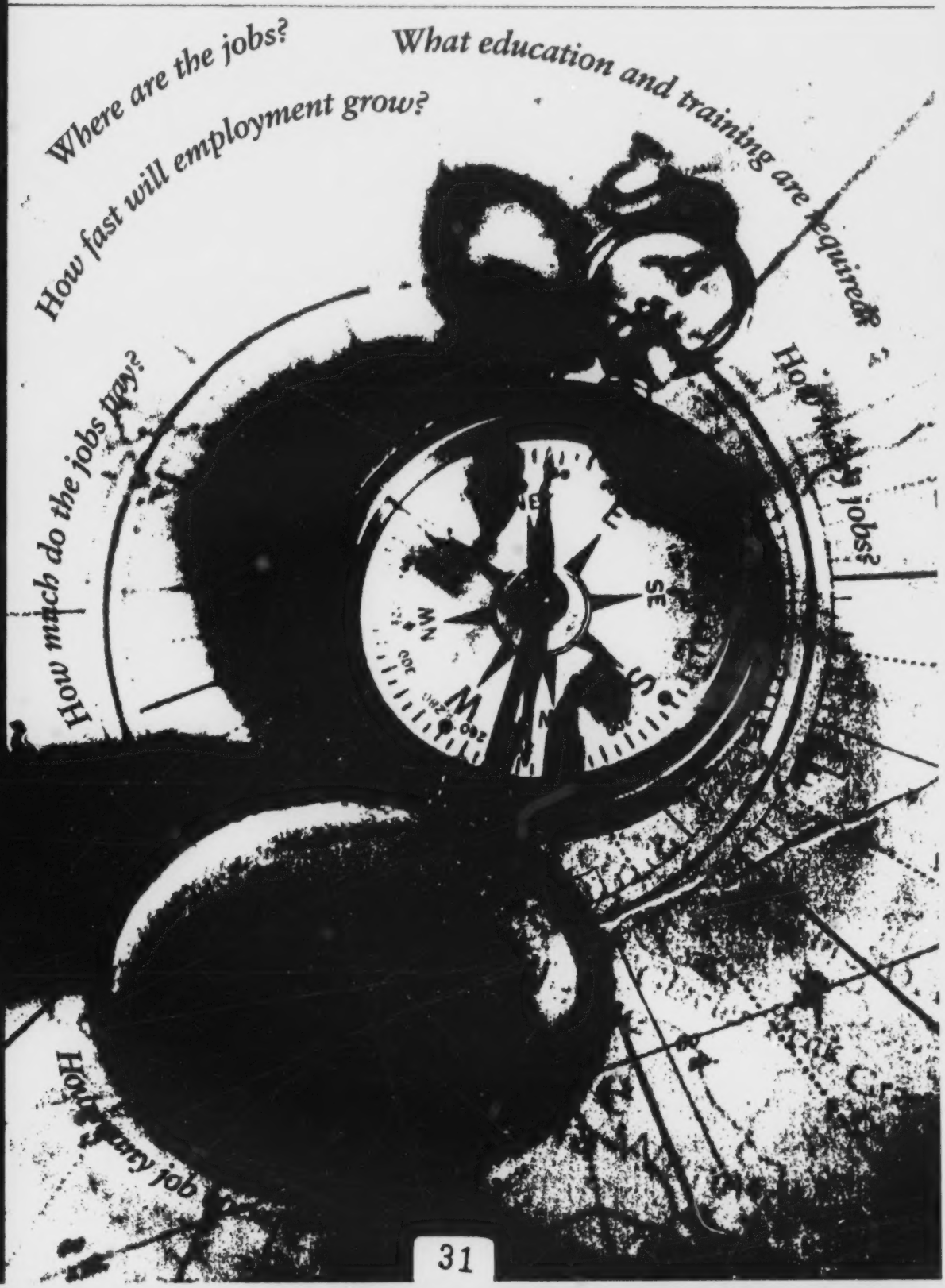
Business and Management Career Cluster

Food Service Careers


Where are the jobs?
How fast will employment grow?
What education and training are required?
How much do the jobs pay?
How many jobs?
How many job

Food Service Careers

The Food Service career field includes careers in restaurants and in institutions with dining facilities. This is one of several career fields in Business and Management.

How many jobs?

In 1998, there were about 464,000 jobs in Ohio in the Food Service career field. The largest occupations range from about 89,500 jobs for waiters and waitresses, to about 15,700 jobs for dining room attendants and bartender helpers.

Ten Largest Food Service Occupations

	Occupation	1998 Employment
1.	Waiters and Waitresses	89,460
2.	Food Preparation and Service, Fast Food	87,540
3.	Food Preparation Workers	58,290
4.	Restaurant Cooks	34,650
5.	All Other Service Supervisors	30,970
6.	Food Service and Lodging Managers	27,530
7.	Fast Food Cooks	23,400
8.	Bartenders	21,530
9.	Institution or Cafeteria Cooks	18,120
10.	Dining Room Attendants and Bartender Helpers	15,710

How fast will employment grow?

Between 1998 and 2008, the number of jobs in the Food Service career field is expected to grow by 10.1 percent, near the average rate of 12.5 percent for all occupations in the state.

The 10 fastest-growing occupations in the Food Service career field include three with job growth faster than the average rate: certain service supervisors, hosts and hostesses, and food servers.

The remaining fastest-growing occupations are expected to grow at about average rates, except fast food preparation and service, which is expected to grow more slowly than average.

Ten Fastest-Growing Food Service Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	All Other Service Supervisors	21.5%
2.	Hosts and Hostesses	16.5%
3.	Food Servers	16.0%
4.	Restaurant Cooks	14.7%
5.	Short Order Cooks	14.5%
6.	Fast Food Cooks	14.3%
7.	Food Service and Lodging Managers	13.0%
8.	Bakers, Bread and Pastry	12.2%
9.	Waiters and Waitresses	10.9%
10.	Food Preparation and Service, Fast Food	8.0%

How many job openings are expected?

Occupations in the Food Service career field will generate more than 249,500 job openings over the decade. These job openings will result in part from the creation of about 46,700 new jobs. The remaining openings will be replacements for current workers.

Two occupations are expected to have more than 50,000 job openings: waiters and waitresses, with about 59,000 openings, and fast food preparation and service, with about 55,200 openings. The occupation of food preparation workers is expected to generate about 36,700 openings.

Ten Food Service Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	Waiters and Waitresses	59,050
2.	Food Preparation and Service, Fast Food	55,220
3.	Food Preparation Workers	36,670
4.	Restaurant Cooks	14,160
5.	All Other Service Supervisors	13,740
6.	Lunchroom and Café Counter Attendants	13,680
7.	Fast Food Cooks	9,450
8.	Bartenders	9,220
9.	Food Service and Lodging Managers	8,400
10.	All Other Food Service Workers	6,480

What education and training are required?

Occupations in the Food Service career field require various education and training levels. About 22,000 openings will occur in occupations that require work experience in a related occupation. These openings are for food service and lodging managers, and all other service supervisors.

An additional 19,000 openings will occur in occupations requiring an apprenticeship or more than one year of training and work experience. Most of these openings are for restaurant cooks.

There will be another 2,700 openings for bread and pastry bakers, an occupation that requires one to 12 months of training and work experience.

There also will be large numbers of openings in occupations requiring only brief training. Most of these openings will be for waiters and waitresses, and food preparation workers and servers.

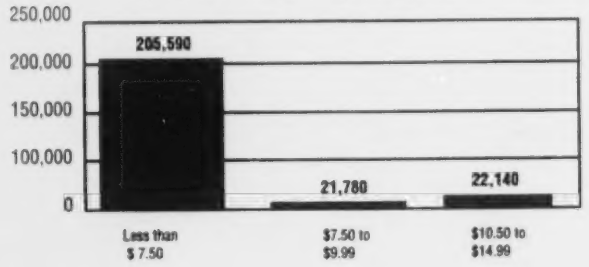
How much do the jobs pay?

The largest number of job openings in the Food Service career field will be in occupations with average hourly wages of less than $7.50 in 1998. Most of these 205,590 openings are for waiters and waitresses, fast food preparation and service, food preparation workers, and lunchroom and café counter attendants. Some of these workers have additional earnings through tips.

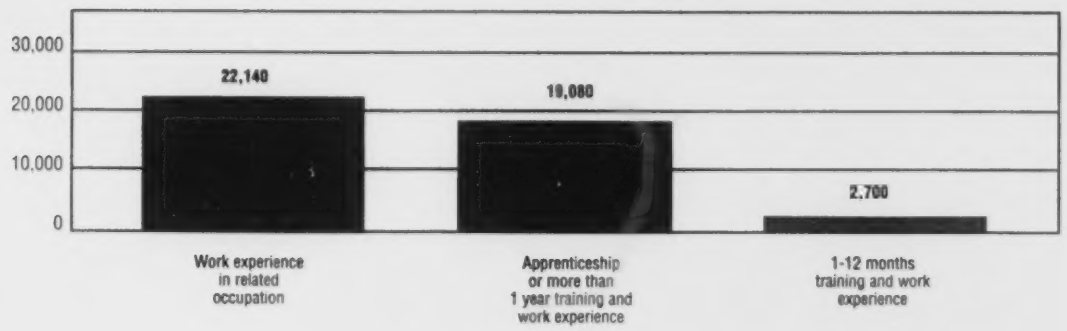
An additional 22,140 openings will be available in occupations with 1998 average wages of $10 to $14.99 per hour. These openings are for food service and lodging managers, and all other service supervisors.

About 21,800 openings are projected for occupations with 1998 average hourly wages of $7.50 to $9.99. The majority of these openings are for restaurant cooks, and cooks who work in cafeterias and in hospitals, schools and other institutions.

Food Service Total Job Openings, 1998-2008, by 1998 Average Wage Category



Food Service Total Job Openings, 1998-2008, by Education and Training Level



Food Service Careers

Where are the jobs?

Most jobs in the Food Service career field are found in:

Restaurants and other eating and drinking places such as cafeterias, sandwich shops, and bars.

Institutions that provide food services, such as schools and hospitals.

Where can I find more information?

Ohio's labor market information system at **lmi.state.oh.us** and the Occupational Outlook Handbook at **stats.bls.gov/ocohome.htm** are sources of additional information and links to Ohio and national job banks, career and occupational resources, and education and training opportunities.

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Work experience, plus a bachelor's or higher degree — Most occupations in this category are managerial occupations that require experience in a related nonmanagerial position.

Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

Associate degree — Completion of the degree program usually requires at least two years of full-time equivalent academic study.

Postsecondary vocational training — Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.

Work experience in a related occupation — Occupations requiring work experience include some supervisory or managerial jobs.

Apprenticeship or more than one year training and work experience — Some occupations generally require more than 12 months of on-the-job training, or combined work experience and formal classroom instruction, for workers to develop the skills needed for average job performance. This category includes formal and informal apprenticeships that may last up to four years and short-term intensive employer-sponsored training that workers must successfully complete. Individuals undergoing training are generally considered to be employed in the occupation. This category includes occupations in which workers may gain experience in non-work activities, such as professional athletes who gain experience through participation in athletic programs in academic institutions.

1 to 12 months training and work experience — This category pertains to occupations in which workers can develop the skills needed for average job performance after 1 to 12 months of combined on-the-job experience and informal training.

Center for Curriculum & Assessment

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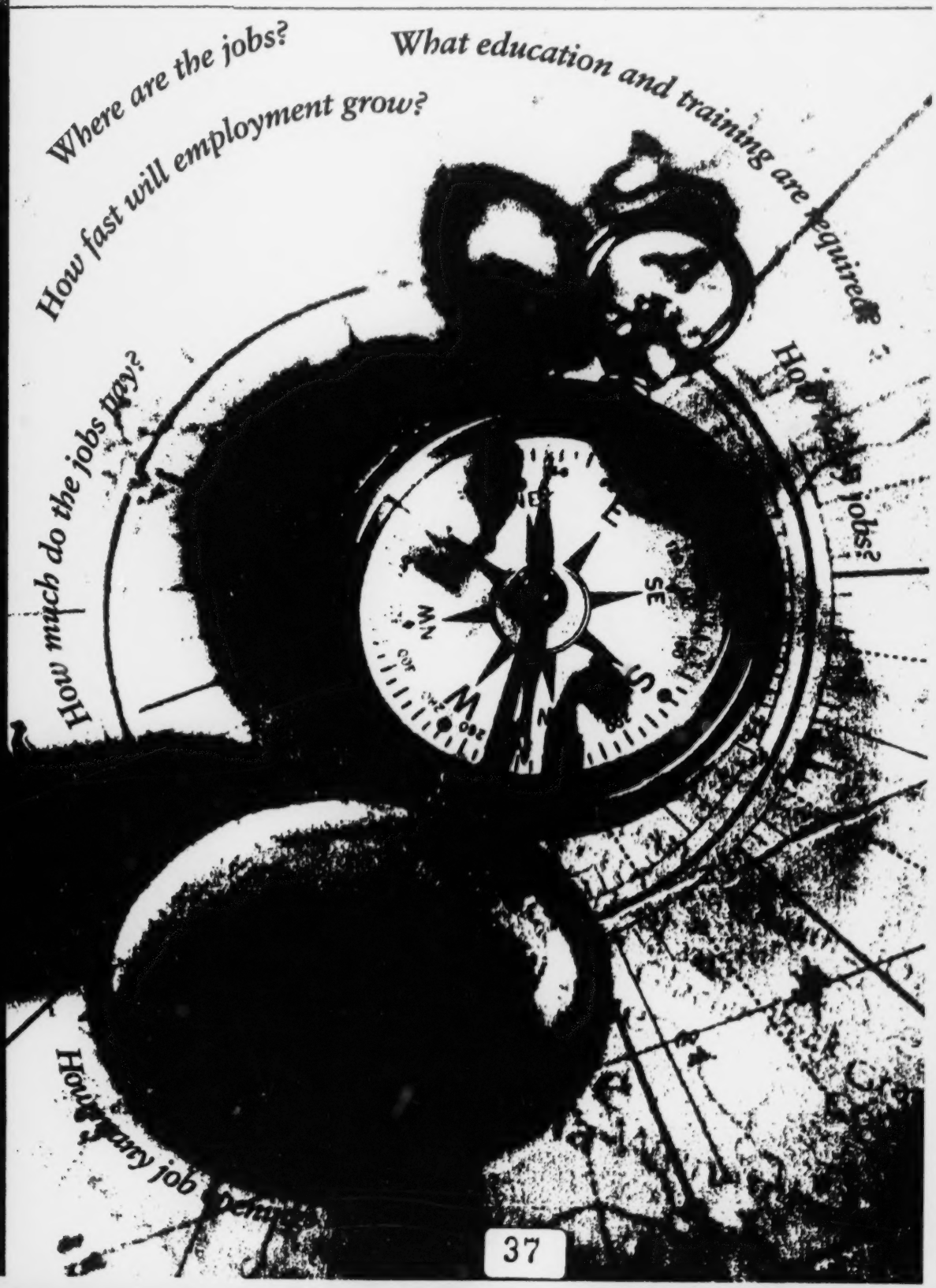
Business and Management Career Cluster

Administrative Support Careers


Where are the jobs?
How fast will employment grow?
What education and training are required?
How much do the jobs pay?
How many jobs?
How many job openings?

Administrative Support Careers

The Administrative Support career field includes careers as secretaries, receptionists, word processors, clerks, and mail carriers. This is one of several career fields in Business and Management.

How many jobs?

In 1998, there were about 576,000 jobs in Ohio in the Administrative Support career field. The 10 largest occupations range from about 116,700 jobs for general office clerks to about 13,600 jobs for postal mail carriers.

Ten Largest Administrative Support Occupations

	Occupation	1998 Employment
1.	General Office Clerks	116,710
2.	Secretaries, Except Legal and Medical	111,300
3.	Office and Administrative Support Supervisors	55,610
4.	Receptionists and Information Clerks	50,420
5.	All Other Clerical and Administrative Support Occupations	31,060
6.	Data Entry Keyers, Except Composing	18,640
7.	Billing, Cost and Rate Clerks	15,240
8.	Administrative Services Manager	14,270
9.	Word Processors and Typists	14,140
10.	Postal Mail Carriers	13,580

How fast will employment grow?

Between 1998 and 2008, the number of jobs in the Administrative Support career field is expected to grow by 8.0 percent, more slowly than the average rate of 12.5 percent projected for all occupations in the state.

The 10 fastest-growing occupations in the Administrative Support career field include two with job growth two to three times faster than the average rate: medical records and health information technicians, and license clerks.

The remaining fastest-growing occupations are expected to grow at above average rates.

Ten Fastest-Growing Administrative Support Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Medical Records and Health Information Technicians	35.1%
2.	License Clerks	23.6%
3.	Receptionists and Information Clerks	21.5%
4.	Duplicating Machine Operators	19.6%
5.	Office and Administrative Support Supervisors	17.4%
6.	Directory Assistance Operators	16.0%
7.	Interviewing Clerks, Except Personnel	15.2%
8.	Administrative Services Manager	14.9%
9.	All Other Clerical and Administrative Support Occupations	14.1%
10.	General Office Clerks	12.9%

How many job openings are expected?

Occupations in the Administrative Support career field will generate more than 174,000 job openings over the decade. These job openings will result in part from the creation of about 46,000 new jobs. The remaining openings will be replacements for current workers.

The occupation of general office clerks is expected to have more than 47,000 job openings. Two occupations will have at least 20,000 job openings: office and administrative support supervisors, and receptionists and information clerks. There will be about 18,000 openings for secretaries.

Ten Administrative Support Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	General Office Clerks	47,340
2.	Office and Administrative Support Supervisors	22,170
3.	Receptionists and Information Clerks	20,470
4.	Secretaries, Except Legal and Medical	18,160
5.	All Other Clerical and Administrative Support Occupations	9,390
6.	Billing, Cost and Rate Clerks	4,790
7.	Postal Mail Carriers	4,740
8.	Administrative Services Manager	4,620
9.	File Clerks	4,000
10.	Data Entry Keyers, Except Composing	3,380

What education and training are required?

Occupations in the Administrative Support career field require various education and training levels. About 4,600 openings will occur in occupations that require education beyond a bachelor's degree. These openings are administrative services management positions.

Nearly 2,200 openings will require an associate degree. This is for the occupation of medical records and health information technicians.

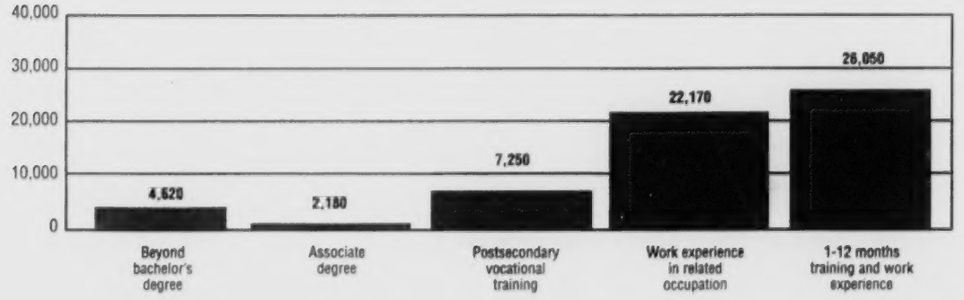
There will be another 7,250 openings for occupations requiring postsecondary vocational training. These openings will occur in the occupations of medical secretaries, legal secretaries, and court reporters and medical transcribers.

The occupation of office and administrative support supervisors, which will have more than 22,000 openings over the decade, requires work experience in a related occupation.

More than 26,000 openings will occur in occupations requiring one to 12 months of training and work experience. The largest number of openings will be for secretaries.

In addition, there will be large numbers of openings for entry-level occupations requiring little training. Most of these openings will be for general office clerks, and receptionists and information clerks.

Administrative Support Total Job Openings, 1998-2008, by Education and Training Levels



How much do the jobs pay?

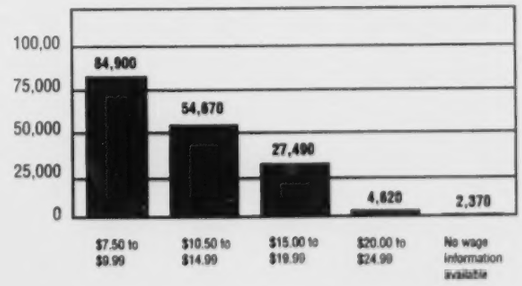
The largest number of job openings in the Administrative Support career field will be in occupations with average hourly wages of $7.50 to $9.99 in 1998. Most of these 84,900 openings are for general office clerks, and receptionists and information clerks.

Nearly 54,700 openings will be available in occupations with 1998 average wages of $10 to $14.99 per hour. Large numbers of these openings are for secretaries and for other clerical and administrative support occupations.

About 27,500 openings are projected for occupations with average hourly wages of $15 to $19.99 in 1998. The majority of these openings are for office and administrative support supervisors.

More than 4,600 job openings are expected for the occupation of administrative services manager, with average 1998 hourly wages of $20 to $24.99.

Administrative Support Total Job Openings, 1998-2008, by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Administrative Support career field are found throughout business, industry and government, especially in educational institutions, local government, and personnel supply services.

Where can I find more information?

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Administrative Support Careers

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Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

Associate degree — Completion of the degree program usually requires at least two years of full-time equivalent academic study.

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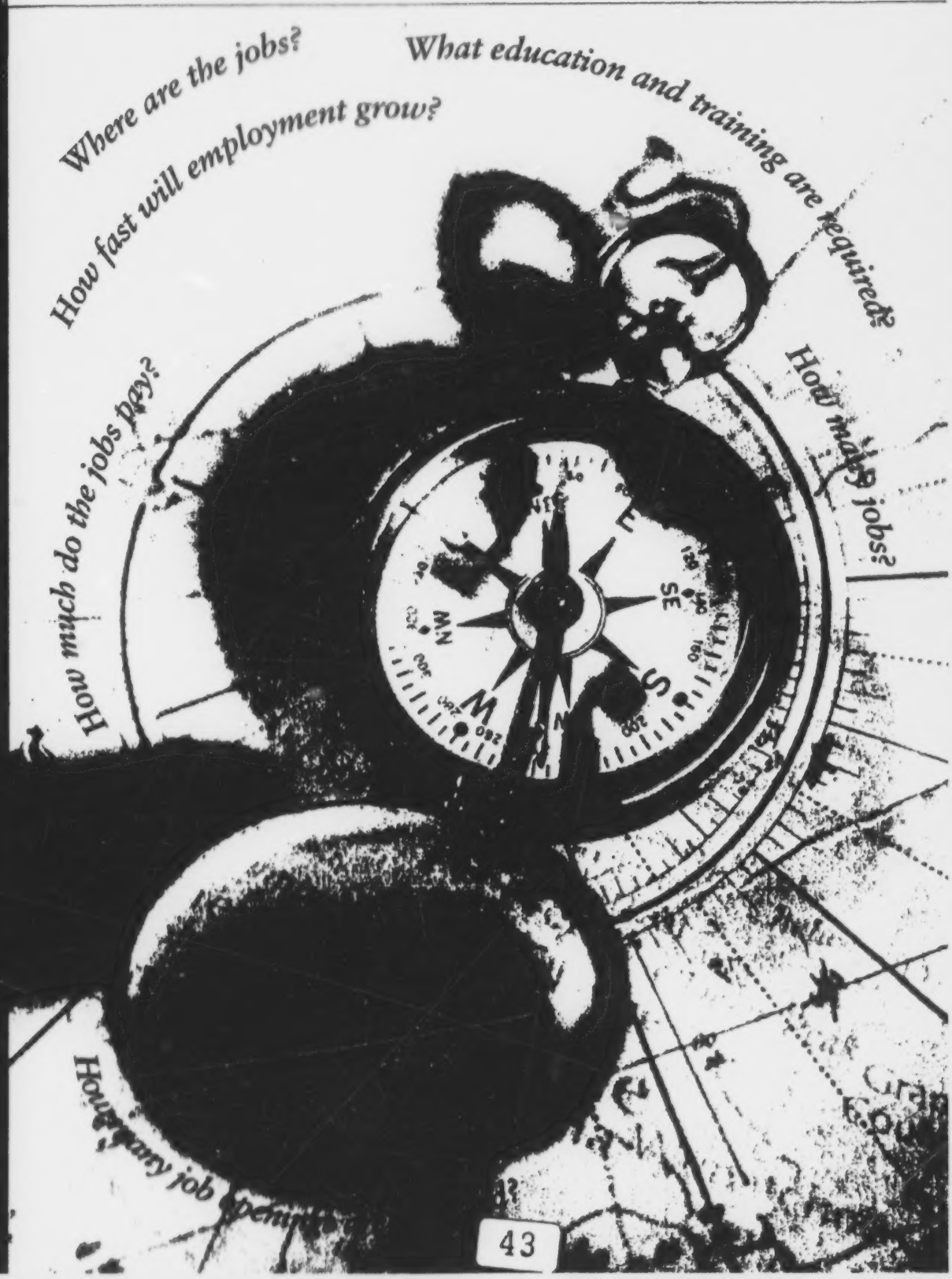
Finance, Insurance and Real Estate Careers


Where are the jobs?
How fast will employment grow?
What education and training are required?
How many jobs?
How much do the jobs pay?
How many job openings?

Finance, Insurance and Real Estate Careers

The Finance, Insurance and Real Estate career field includes careers in banking, accounting, bookkeeping; in selling securities, insurance and real estate; and in a variety of administrative and management occupations. This is one of several career fields in Business and Management.

How many jobs?

In 1998, there were about 334,000 jobs in Ohio in the Finance, Insurance and Real Estate career field. The largest occupations range from more than 78,000 jobs for bookkeeping, accounting and auditing clerks to about 9,500 jobs for certain financial specialists.

Ten Largest Finance, Insurance and Real Estate Occupations in Ohio

	Occupation	1998 Employment
1.	Bookkeeping, Accounting and Auditing Clerks	78,300
2.	Accountants and Auditors	36,320
3.	Financial Managers	28,800
4.	Adjustment Clerks	26,830
5.	Bank Tellers	23,760
6.	Insurance Sales Workers	15,420
7.	Bill and Account Collectors	13,690
8.	Real Estate Sales Agents	11,560
9.	Loan Officers and Counselors	9,990
10.	All Other Financial Specialists	9,470

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 11.7 percent, near the average rate of 12.5 percent for all occupations in the state.

The 10 fastest-growing occupations in the Finance, Insurance and Real Estate career field include six occupations with job growth at about twice to three times the average rate: securities and financial service sales, bill and account collectors, adjustment clerks, statistical financial analysts, brokerage clerks, and loan officers and counselors. The remaining fastest-growing occupations are expected to grow at above average rates.

Ten Fastest-Growing Finance, Insurance and Real Estate Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Securities and Financial Service Sales	43.2%
2.	Bill and Account Collectors	32.9%
3.	Adjustment Clerks	31.4%
4.	Statistical Financial Analysts	30.5%
5.	Brokerage Clerks	27.9%
6.	Loan Officers and Counselors	25.6%
7.	Tax Preparers	23.5%
8.	Insurance Adjusters and Investigators	22.4%
9.	Auto Damage Insurance Appraisers	21.7%
10.	Real Estate Brokers	18.0%

How many job openings are expected?

Occupations in the Finance, Insurance and Real Estate career field will generate more than 103,000 job openings over the decade. These job openings will result in part from the creation of about 39,000 new jobs. The remainder will be replacements for current workers.

Fast growth rates do not necessarily indicate a large number of job openings. Altogether, the 10 fastest-growing occupations account for 32 percent of the job openings expected over the decade in the career field, or about 33,000 openings.

However, the 10 occupations expected to have the most job openings will provide a total of more than 78,400 openings, or 76 percent of all openings expected for the Finance, Insurance and Real Estate career field.

Three occupations are expected to have more than 10,000 openings: bookkeeping and related clerks, bank tellers, and adjustment clerks. The remaining occupations will provide about 3,900 to 9,500 openings each.

Ten Finance, Insurance and Real Estate Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	Bookkeeping, Accounting and Auditing Clerks	14,610
2.	Bank Tellers	10,200
3.	Adjustment Clerks	10,160
4.	Accountants and Auditors	9,460
5.	Bill and Account Collectors	8,120
6.	Financial Managers	8,010
7.	Loan Officers and Counselors	4,750
8.	Securities and Financial Service Sales	4,620
9.	Insurance Sales Workers	4,500
10.	Real Estate Sales Agents	3,990

What education and training are required?

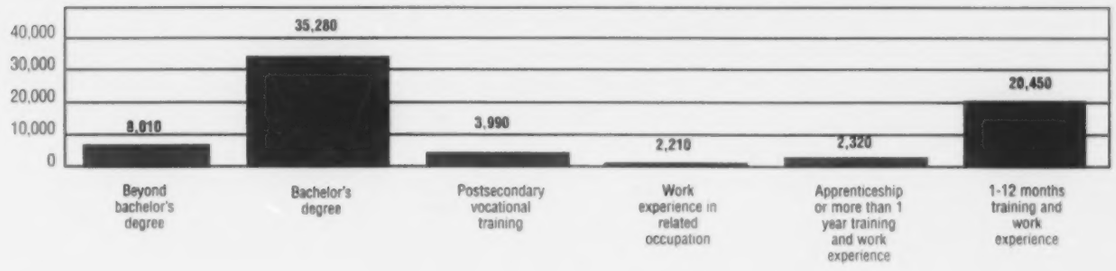
Occupations in the Finance, Insurance and Real Estate career field require various education and training levels. The largest number of openings, about 35,000, is among occupations requiring a bachelor's degree. These openings are primarily for accountants and auditors, loan officers and counselors, securities and financial service sales workers, and insurance sales workers.

An additional 20,450 openings will occur in occupations requiring one to 12 months of training and work experience, with most of these openings for bookkeeping and related clerks.

The occupation of financial managers will provide about 8,000 job openings and generally requires work experience and a bachelor's or higher degree.

There will also be large numbers of openings in occupations requiring only brief training. Most of these openings will be for bank tellers, adjustment clerks, and bill and account collectors.

Finance, Insurance and Real Estate Total Job Openings, 1998-2008, by Education and Training Level



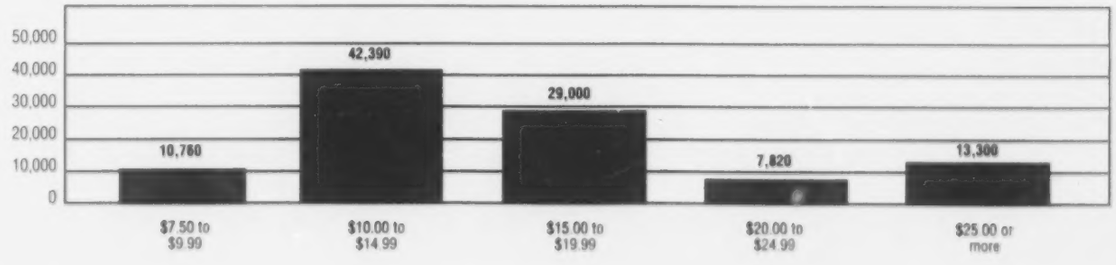
How much do the jobs pay?

The largest number of job openings in the Finance, Insurance and Real Estate career field will be in occupations with mean wages of $10 to $14.99 in 1998. The majority of these 42,390 openings are for bookkeeping and related clerks, and adjustment clerks.

An additional 29,000 openings will be available in occupations with 1998 average wages of $15 to $19.99 per hour. Most of these openings are for accountants and auditors, and loan officers and counselors.

About 13,300 openings are projected with 1998 average hourly wages of $25 or more. The majority of the openings are for securities and financial service sales workers, and financial managers.

Finance, Insurance and Real Estate Total Job Openings, 1998-2008, by 1998 Average Wage Category



Finance, Insurance and Real Estate Careers

Where are the jobs?

Most jobs related to the Finance, Insurance and Real Estate career field are found in:

Banks and Credit Institutions — businesses that provide banking and credit services.

Securities and Commodity Brokers — businesses that buy and sell stocks, bonds, and commodities.

Insurance Carriers and Agents — businesses that underwrite and sell insurance.

Real Estate — businesses that operate, manage, and sell real estate.

Where can I find more information?

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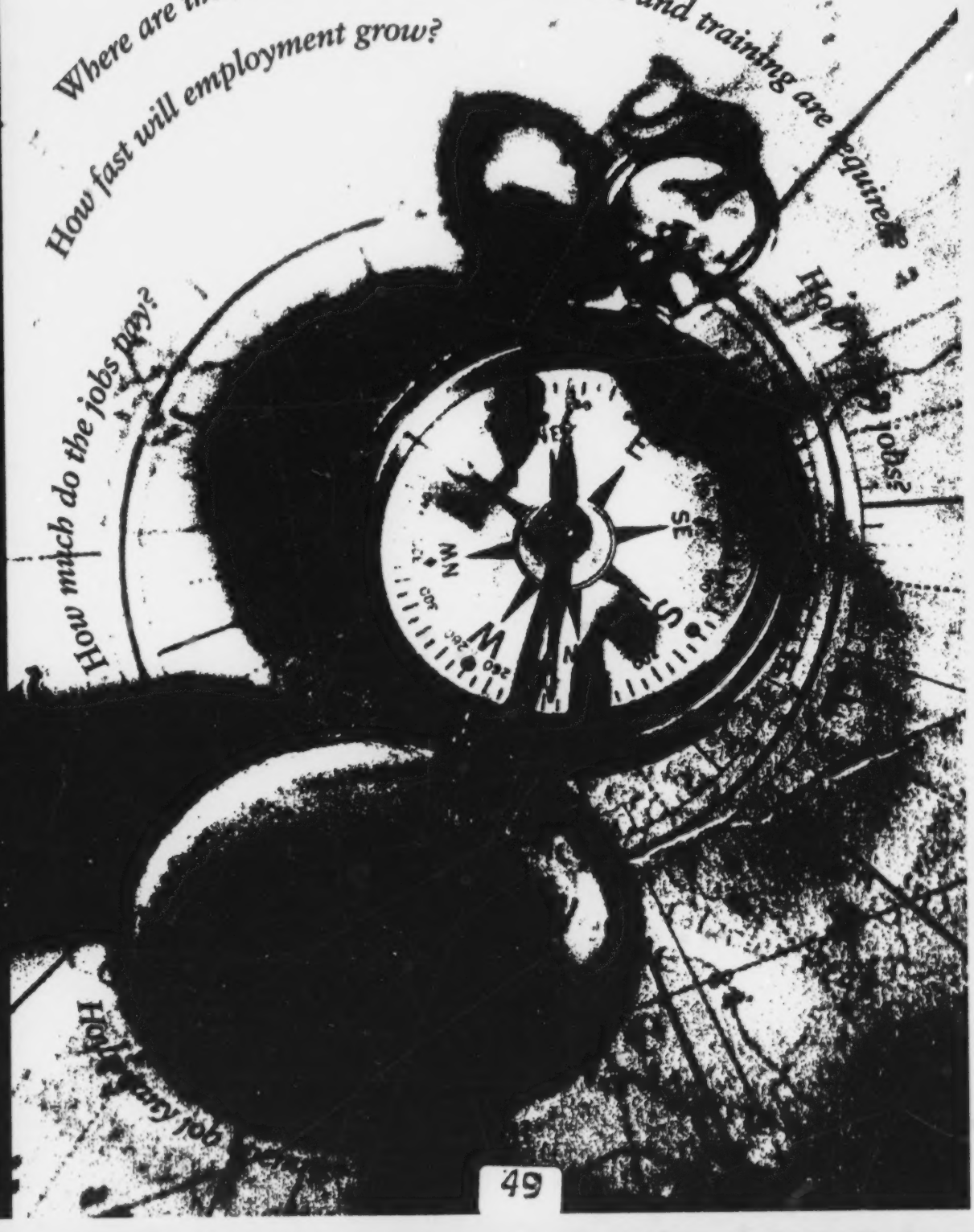
Health Services Career Cluster

Nursing and Dietetics Careers



Nursing and Dietetics Careers

The Nursing and Dietetics career field includes careers in nursing and dietetic science. This is one of several career fields in Health Services.

How many jobs?

In 1998, there were nearly 136,000 jobs in Ohio in the Nursing and Dietetics career field. The largest occupation was registered nurses with more than 100,000 jobs. There were more than 33,000 jobs for licensed practical nurses and nearly 2,300 jobs for dietitians and nutritionists.

Nursing and Dietetics Occupations Ranked by Employment

Occupation	1998 Employment
RegisteredNurses	100,360
Licensed Practical Nurses	33,130
Dietitians and Nutritionists	2,280

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by nearly 21 percent, faster than the projected average rate of 12.5 percent for all occupations in the state. The fastest-growing occupation will be licensed practical nurses, which will grow at 25.2 percent, while the occupation of dietitians and nutritionists will grow at 16.2 percent. The occupation of registered nurses will grow at 19.4 percent.

Nursing and Dietetics Occupations Ranked by Job Growth Rate, 1998-2008

Occupation	Job Growth Rate
Licensed Practical Nurses	25.2%
Registered Nurses	19.4%
Dietitians and Nutritionists	16.2%

How many job openings are expected?

Occupations in the Nursing and Dietetics career field will generate more than 52,000 job openings over the decade, including more than 28,000 new jobs. The remaining openings will be replacements for current workers.

The occupation of registered nurses is expected to provide by far the most openings over the decade with 36,080 total job openings. The occupation of licensed practical nurses will provide 15,430 openings, and dietitians and nutritionists, 830 openings.

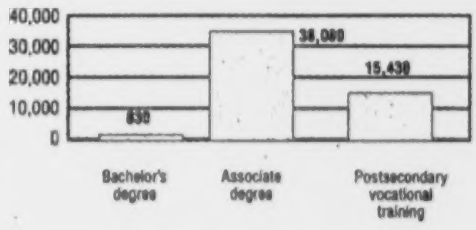
Nursing and Dietetics Occupations Ranked by Total Job Openings, 1998-2008

Occupation	Total Job Openings
Registered Nurses	36,080
Licensed Practical Nurses	15,430
Dietitians and Nutritionists	830

What education and training are required?

More than one-half of the job openings expected over the 1998-2008 decade, or 36,080 openings, will be in registered nursing, which requires at least an associate degree. The occupation of dietitian and nutritionist requires a bachelor's degree, while the occupation of licensed practical nurses, with 15,340 openings, requires postsecondary vocational training.

Nursing and Dietetics Total Job Openings, 1998-2008, by Education and Training Level



How much do the jobs pay?

The largest number of job openings in the Nursing and Dietetics career field will be in occupations with average hourly wages of $15 to $19.99 in 1998.

The large majority of the 36,910 openings are for registered nurses, with the remainder for dieticians and nutritionists. An additional 15,340 openings, for licensed practical nurses, will provide 1998 hourly wages in the $10 to $14.99 range.

Nursing and Dietetics
Total Job Openings, 1998-2008,
and 1998 Average Hourly Wages

Occupation	Total Job Openings	Average Hourly Wage
Registered Nurses	36,080	$19.05
Dietitians and Nutritionists	830	$16.74
Licensed Practical Nurses	15,430	$13.56

Where are the jobs?

Most jobs in the Nursing and Dietetics career field are found in hospitals, doctors' offices, nursing and personal care facilities, and organizations that provide home health care.

Where can I find more information?

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Center for Curriculum & Assessment

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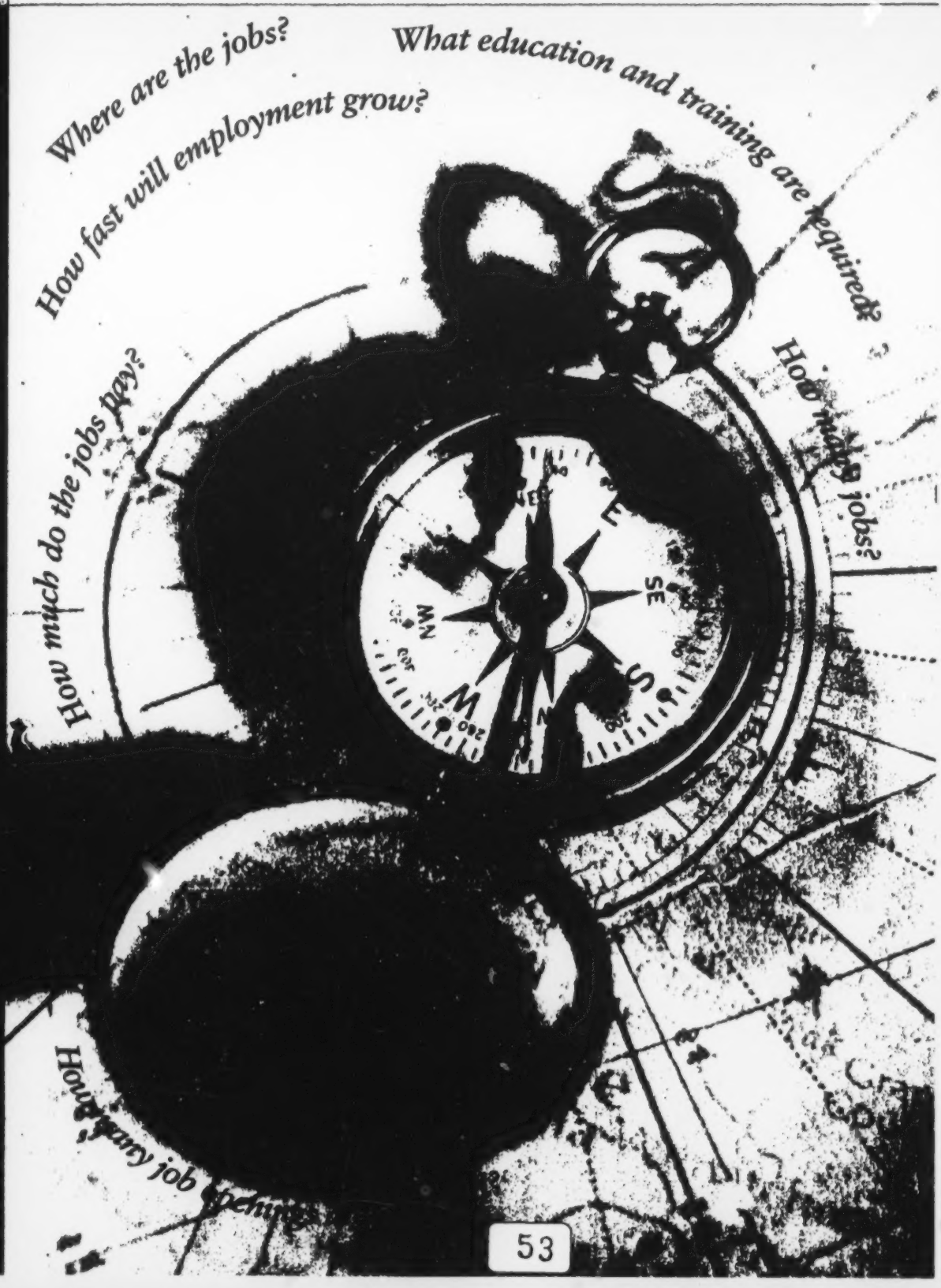
Health Services Career Cluster

Health Care Technology Careers


Where are the jobs?
What education and training are required?
How fast will employment grow?
How much do the jobs pay?
How many jobs?
How many job openings?

Health Care Technology Careers

The Health Care Technology career field includes careers as health technicians and technologists, inspectors, paramedics and dental hygienists. This is one of several career fields in Health Services.

How many jobs?

In 1998, there were about 88,500 jobs in Ohio in the Health Care Technology career field. The 10 largest occupations range from 16,280 jobs for certain health professionals and technicians to 3,320 jobs for science technicians.

Ten Largest Health Care Technology Occupations

	Occupation	1998 Employment
1.	All Other Health Professionals, Paraprofessionals and Technicians	16,280
2.	Inspectors and Compliance Officers	8,730
3.	Radiologic Technicians and Technologists	7,770
4.	Emergency Medical Technicians and Paramedics	7,220
5.	Medical and Clinical Laboratory Technologists	6,950
6.	Pharmacy Technicians	6,620
7.	Dental Hygienists	6,180
8.	All Other Health Service Workers	6,160
9.	Medical and Clinical Laboratory Technicians	5,340
10.	All Other Science Technicians	3,320

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 18.9 percent, faster than the projected average rate of 12.5 percent for all occupations in the state. The 10 fastest-growing occupations in Health Care Technology include five that are expected to grow at two and three times the rate for all occupations: physician assistants, cardiovascular technologists and technicians, dental hygienists, surgical technicians, and all other health professionals and technicians.

The remaining 10 fastest-growing occupations are expected to grow faster than average.

Ten Fastest-Growing Health Care Technology Occupations 1998-2008

	Occupation	Job Growth Rate
1.	Physician Assistants	44.8%
2.	Cardiovascular Technologists and Technicians	38.8%
3.	All Other Health Professionals, Paraprofessionals and Technicians	36.2%
4.	Dental Hygienists	33.8%
5.	Surgical Technicians	29.7%
6.	Dietetic Technicians	22.0%
7.	Emergency Medical Technicians and Paramedics	18.4%
8.	Pharmacy Technicians	18.1%
9.	Radiologic Technicians and Technologists	14.8%
10.	Pharmacy Aides	14.7%

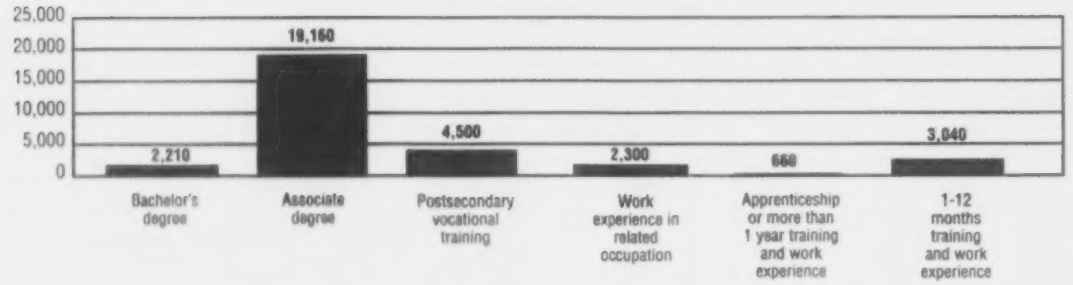
How many job openings are expected?

Occupations in the Health Care Technology career field will generate about 35,000 job openings over the decade. These openings will result partly from the creation of about 16,700 new jobs. The remaining openings will be replacements for current workers.

The largest demand will be for certain health professionals and technicians, with nearly 10,000 openings.

Three occupations will have about 3,000 openings each over the decade. These are: dental hygienists, emergency medical technicians and paramedics, and pharmacy technicians.

Health Care Technology Total Job Openings, 1998-2008, by Education and Training Levels



Ten Health Care Technology Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	All Other Health Professionals, Paraprofessionals and Technicians	9,920
2.	Dental Hygienists	3,480
3.	Emergency Medical Technicians and Paramedics	3,120
4.	Pharmacy Technicians	2,840
5.	All Other Health Service Workers	2,330
6.	Inspectors and Compliance Officers	2,300
7.	Radiologic Technicians and Technologists	2,230
8.	Medical and Clinical Laboratory Technicians	1,150
9.	Medical and Clinical Laboratory Technologists	1,150
10.	All Other Science Technicians	1,100

What education and training are required?

Occupations in the Health Care Technology career field cover a wide range of education and training levels. The largest number of openings, 19,160, is for occupations requiring an associate degree. These openings are primarily for certain health professionals and technicians, with 9,920 openings. Other occupations requiring an associate degree that will have large numbers of openings are dental hygienists, and radiologic technicians and technologists.

Two occupations that require a bachelor's degree will have a total of about 2,200 openings: medical and clinical laboratory technologists, and physician assistants.

Occupations requiring postsecondary vocational training will account for 4,500 job openings, primarily for emergency medical technicians and paramedics, and surgical technicians. Another 3,040 openings are expected for occupations requiring one to 12 months of training and work experience; these openings are primarily for pharmacy technicians.

The occupation of inspectors and compliance officers requires work experience in a related occupation and will see 2,300 job openings over the decade.

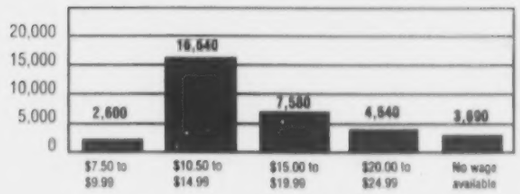
How much do the jobs pay?

The largest number of job openings in the Health Care Technology career field will be in occupations with 1998 average hourly wages of $10 to $14.99. The majority of the 16,640 job openings will be as health professionals and technicians, emergency medical technicians and paramedics, medical and clinical laboratory technicians, and surgical technicians.

An additional 7,580 openings will occur in occupations with 1998 average wages of $15 to $19.99 per hour. Most of these openings are for inspectors and compliance officers, radiologic technicians and technologists, medical and clinical laboratory technologists, and all other science technicians.

About 4,500 openings are projected for occupations with 1998 average wages of $20 to $24.99 per hour. These openings are for dental hygienists, and physicians assistants.

Health Care Technology
Total Job Openings, 1998-2008,
by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Health Care Technology career field are found in hospitals, doctors' and dentists' offices, drug stores, medical and dental laboratories, government and education.

Where can I find more information?

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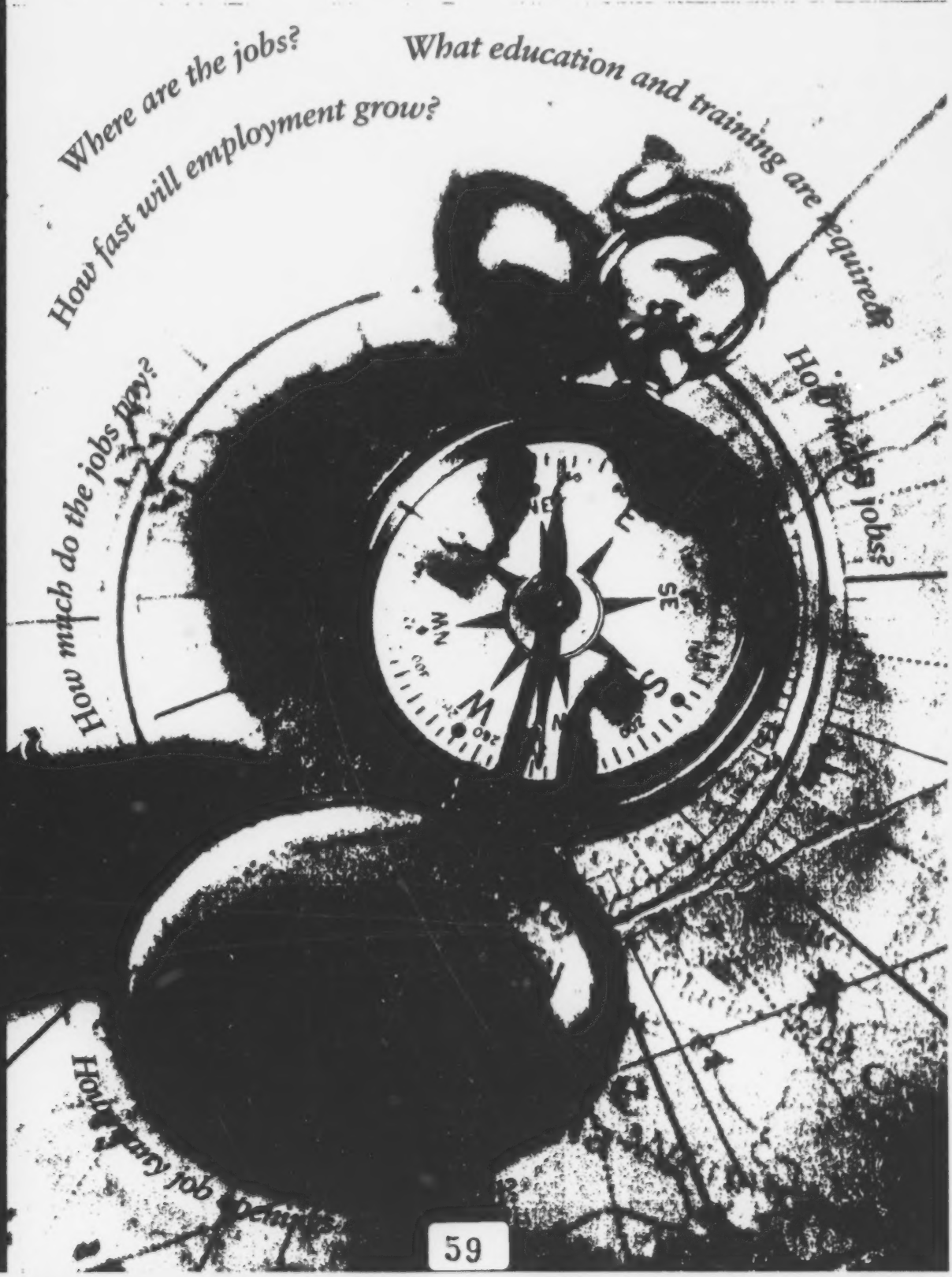
Health Services Career Cluster

Health Care Therapy Careers


Where are the jobs?
How fast will employment grow?
What education and training are required?
How much do the jobs pay?
How many jobs?
How many job openings?

Health Care Therapy Careers

The Health Care Therapy career field includes careers in speech, respiratory, occupational, and physical therapy. This is one of several career fields in Health Services.

How many jobs?

In 1998, there were about 21,000 jobs in Ohio in the Health Care Therapy career field. The largest occupation was speech pathologists and audiologists, followed closely by respiratory therapists and physical therapists.

Health Care Therapy Occupations Ranked by Employment

Occupation	1998 Employment
Speech Pathologists and Audiologists	4,800
Respiratory Therapists	4,550
Physical Therapists	4,330
Occupational Therapists	3,040
All Other Therapists	1,770
Recreational Therapists	1,740
Radiation Therapists	870

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 33 percent, much faster than the projected average rate of 12.5 percent for all occupations in the state. Two occupations that will grow more than three times faster than average are speech pathologists and audiologists, and respiratory therapists. Employment for occupational therapists and physical therapists will grow at twice the average rate expected for all occupations in the state.

Health Care Therapy Occupations Ranked by Job Growth Rate, 1998-2008

Occupation	Job Growth Rate
All Other Therapists	44.1%
Speech Pathologists and Audiologists	40.6%
Respiratory Therapists	38.5%
Occupational Therapists	31.6%
Physical Therapists	28.6%
Recreational Therapists	10.9%
Radiation Therapists	10.3%

How many job openings are expected?

Occupations in the Health Care Therapy career field will generate more than 10,000 job openings over the decade, including nearly 7,000 new jobs. The remainder will be replacements for current workers.

Fast rates of growth do not necessarily indicate a large number of job openings. However, in the Health Care Therapy career field, there are strong correlations between the two. For instance, the occupation of speech pathologists and audiologists will provide the most openings over the decade with 2,670 total job openings. At the same time, the two occupations with the slowest job growth, recreational therapists and radiation therapists, also provide the fewest number of job openings in the decade.

Health Care Therapy Occupations Ranked by Total Job Openings, 1998-2008

Occupation	Total Job Openings
Speech Pathologists and Audiologists	2,670
Respiratory Therapists	2,430
Physical Therapists	1,890
Occupational Therapists	1,420
All Other Therapists	1,040
Recreational Therapists	450
Radiation Therapists	220

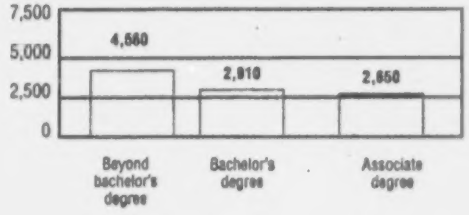
What education and training are required?

Nearly one-half of the job openings expected over the 1998-2008 decade, or 4,560 openings, will be in occupations requiring more than a bachelor's degree. The occupations are speech pathologists and audiologists, and physical therapists.

The occupations requiring a bachelor's degree — occupational therapists, recreational therapists, and all other therapists — will provide more than 2,900 job openings during the decade.

The occupations of respiratory therapists and radiation therapists require an associate degree. They will provide about 2,650 openings.

Health Care Therapy
Total Job Openings, 1998-2008,
by Education and Training Level

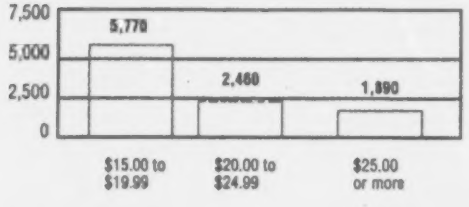


How much do the jobs pay?

The largest number of job openings in the Health Care Therapy career field will be in occupations with average hourly wages of $15 to $19.99 in 1998. The majority of the 5,770 openings are for speech pathologists and audiologists, and respiratory therapists. An additional 2,460 openings will be in occupations with 1998 average hourly wages of $20 to $24.99. A majority of these openings are for occupational therapists.

In the occupation with 1998 average hourly wages of $25 or more, nearly 1,900 openings are expected for physical therapists.

Health Care Therapy
Total Job Openings, 1998-2008,
by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Health Care Therapy career field are found in hospitals, doctors' and dentists' offices, nursing and personal care facilities, education, and home health care services.

Where can I find more information?

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Education and Training Services Careers

Where are the jobs?
How fast will employment grow?
What education and training are required?
How much do the jobs pay?
How many jobs?
How many job openings are

Education and Training Services Careers

The Education and Training Services career field includes careers as teachers, administrators, coaches, librarians, and library and teaching assistants. This is one of several career fields in Human Resources/Services.

How many jobs?

In 1998, there were about 360,500 jobs in Ohio in the Education and Training Services career field. The 10 largest occupations range from 61,280 jobs for elementary school teachers to about 12,500 jobs for paraprofessional teachers aides.

Ten Largest Education and Training Services Occupations

	Occupation	1998 Employment
1.	Elementary Teachers	61,280
2.	Secondary School Teachers	50,850
3.	Child Care Workers	31,470
4.	Special Education Teachers	20,840
5.	Teacher Aides and Educational Assistants	17,510
6.	Sports and Physical Training Instructors and Coaches	17,150
7.	All Other Teachers and Instructors	16,790
8.	Education Administrators	15,540
9.	Vocational Education Teachers	13,440
10.	Teachers Aides, Paraprofessional	12,490

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 18.8 percent, faster than the projected average rate of 12.5 percent for all occupations in the state. The 10 fastest-growing occupations in Education and Training Services include one, postsecondary computer science teachers, that is expected to grow at nearly four times the rate for all occupations.

Two of the fastest-growing occupations will grow at more than three times the average rate for all occupations: postsecondary parks and recreation and fitness teachers, and postsecondary health specialties teachers.

The remaining 10 fastest-growing occupations are each expected to grow at more than double the average rate.

Ten Fastest-Growing Education and Training Services Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Computer Science Teachers, Postsecondary	48.3%
2.	Parks and Recreation and Fitness Teachers, Postsecondary	43.6%
3.	Health Specialties Teachers, Postsecondary	42.5%
4.	Communications Teachers, Postsecondary	34.7%
5.	Special Education Teachers	32.5%
6.	Teachers Aides, Paraprofessional	32.5%
7.	Life Sciences Teachers, Postsecondary	31.4%
8.	Biological Scientists	29.4%
9.	Teacher Aides and Educational Assistants	29.0%
10.	Preschool Teachers	26.7%

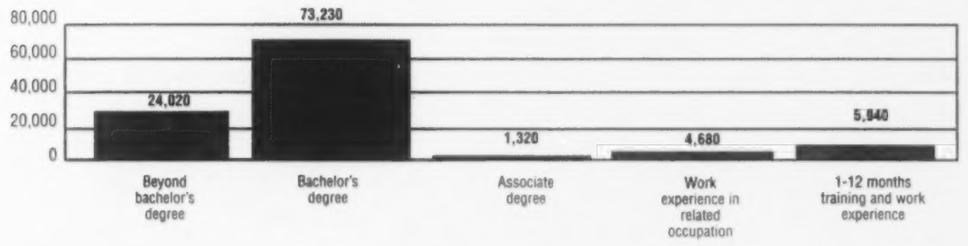
How many job openings are expected?

Occupations in the Education and Training Services career field will generate about 142,800 job openings over the decade. These openings will result partly from the creation of about 67,900 new jobs. The remainder will be replacements for current workers.

The largest demand will be for secondary school teachers, with 27,270 openings. Close behind is elementary teachers with 20,710 openings expected.

Other occupations that will have more than 7,000 openings over the decade include: child care workers, special education teachers, library assistants and bookmobile drivers, and teacher aides and educational assistants.

Education and Training Services Total Job Openings, 1998-2008, by Education and Training Levels



Ten Education and Training Services Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	Secondary School Teachers	27,270
2.	Elementary Teachers	20,710
3.	Child Care Workers	11,300
4.	Special Education Teachers	8,540
5.	Library Assistants and Bookmobile Drivers	7,620
6.	Teacher Aides and Educational Assistants	7,090
7.	Sports and Physical Training Instructors and Coaches	5,940
8.	Education Administrators	5,830
9.	Teachers Aides, Paraprofessional	5,490
10.	Preschool Teachers	5,220

What education and training are required?

Occupations in the Education and Training Services career field cover a wide range of education and training levels. The largest number of openings, 73,230, is for occupations requiring a bachelor's degree. These openings are primarily for elementary, secondary school, special education and preschool teachers.

There will be an additional 24,020 openings for occupations that require education and training beyond a bachelor's degree. The largest number of job openings at this level will be for education administrators, with an expected 5,830 openings. There will also be a demand for vocational and educational counselors, professional librarians, and certain postsecondary teachers.

Occupations requiring an associate degree will account for 1,320 job openings, primarily for chemical technicians. Another 4,680 openings are expected for occupations requiring work experience in a related occupation, primarily for vocational education teachers and adult nonvocational education instructors.

Nearly 6,000 openings are projected for the occupation of sports and physical training instructors, which requires one to 12 months of training and work experience.

In addition, there will be large numbers of openings for entry-level occupations requiring little training. Most of these openings will be for child care workers, library assistants and bookmobile drivers, and teacher aides and assistants.

How much do the jobs pay?

The largest number of job openings in the Education and Training Services career field will be in occupations with 1998 average hourly wages of $25 to $29.99. The majority of the nearly 40,000 job openings will be as secondary school teachers.

There will be nearly 5,000 job openings in occupations with 1998 average hourly wages of $30 or more. These openings are primarily for varieties of postsecondary teachers.

An additional 38,610 openings will occur in occupations with 1998 average wages of $20 to $24.99 per hour. Most of these openings are for elementary teachers and special education teachers.

About 31,400 openings are projected for occupations with 1998 average wages of $7.50 to $9.99 per hour. These openings are fairly evenly spread among the occupations of: library assistants and bookmobile drivers; teacher aides and assistants; sports and physical training instructors and coaches; preschool teachers; and paraprofessional teachers aides.

Finally, about 11,300 openings are expected for child care workers, with average hourly wages of less than $7.50 in 1998.

Education and Training Services Careers

Education and Training Services
Total Job Openings, 1998-2008,
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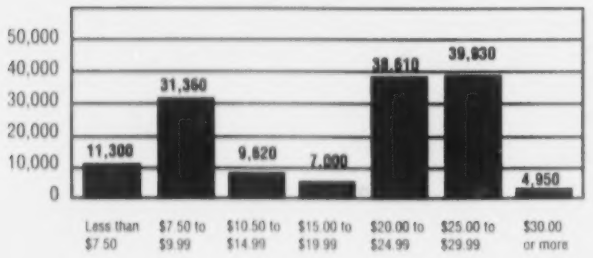

Where are the jobs?

Most jobs in the Education and Training Services career field are found in public and private schools and colleges.

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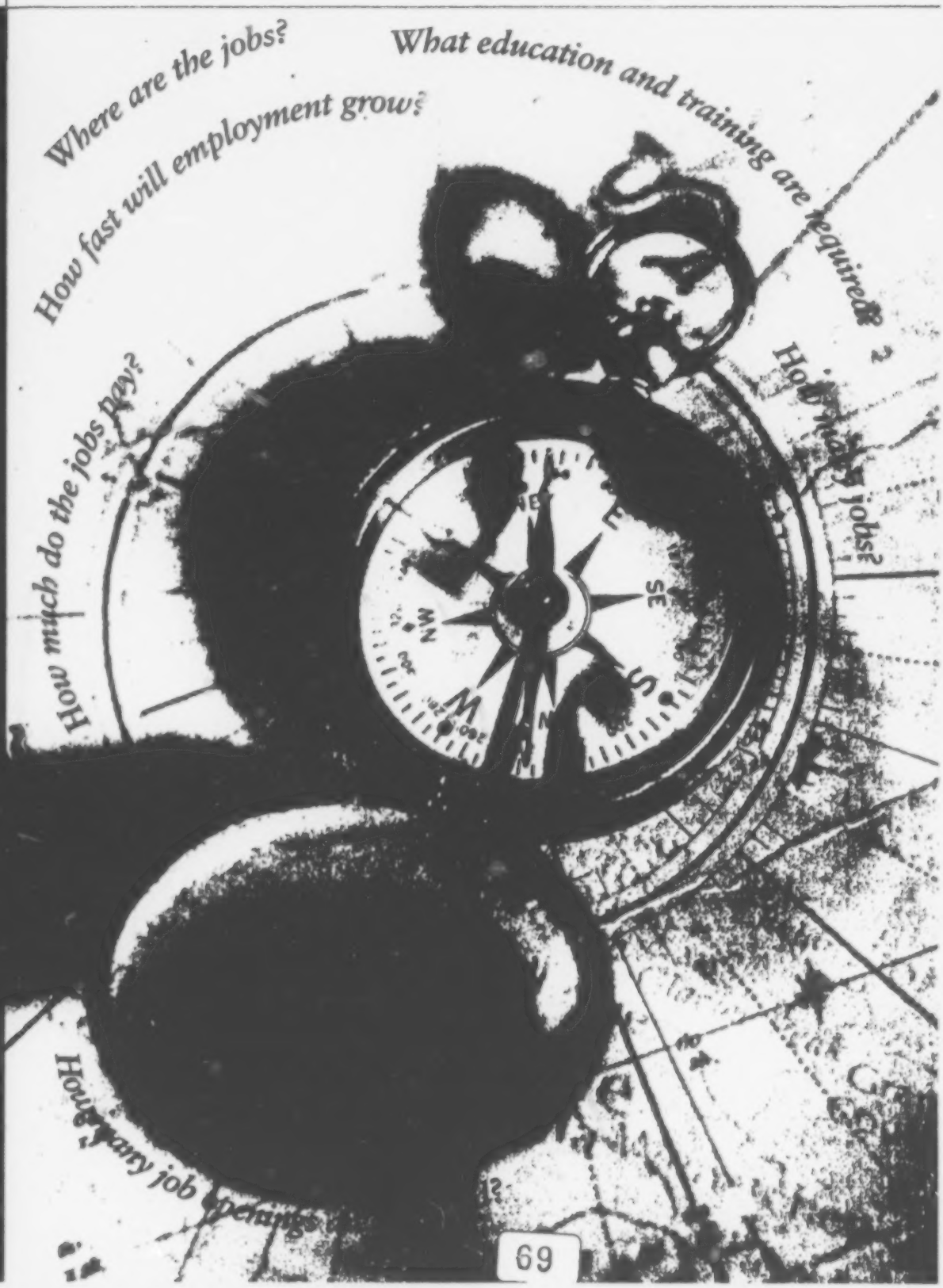
Legal and Protective Services Careers

Human Resources/Services Career Cluster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How fast will employment grow?
How many jobs?
How much do the jobs pay?
How many job openings?

Legal and Protective Services Careers

The Legal and Protective Services career field includes careers in law enforcement and legal services. This is one of several career fields in Human Resources/Services.

How many jobs?

In 1998, there were about 167,400 jobs in Ohio in the Legal and Protective Services career field. The 10 largest occupations range from more than 28,000 jobs for guards to about 4,200 jobs for private detectives and investigators.

Ten Largest Legal and Protective Services Occupations

	Occupation	1998 Employment
1.	Guards	28,250
2.	All Other Professional, Paraprofessional and Technical Workers	27,590
3.	Lawyers	22,510
4.	Police Patrol Officers	16,100
5.	Fire Fighters	16,010
6.	Inspectors and Compliance Officers	8,730
7.	All Other Protective Service Workers	7,030
8.	Police and Detective Supervisors	4,700
9.	Correction Officers and Jailers	4,230
10.	Detectives and Investigators, Except Public	4,180

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 16.4 percent, faster than the average rate of 12.5 percent for all occupations in the state.

The 10 fastest-growing occupations in the Legal and Protective Services career field include two with job growth at more than three times the average rate: paralegal and legal assistants, and correction officers and jailers. Three other occupations will grow at more than twice the expected average rate. These are sheriffs and deputy sheriffs, police patrol officers, and all other legal assistants. The remaining 10 fastest-growing occupations are expected to grow at above average rates.

Ten Fastest-Growing Legal and Protective Services Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Paralegal and Legal Assistants	58.4%
2.	Correction Officers and Jailers	40.2%
3.	All Other Legal Assistants	32.1%
4.	Sheriffs and Deputy Sheriffs	28.8%
5.	Police Patrol Officers	28.2%
6.	Detectives and Investigators, Except Public	19.9%
7.	Police Detectives	19.3%
8.	Guards	19.1%
9.	All Other Protective Service Workers	18.5%
10.	All Other Professional, Paraprofessional and Technical Workers	18.2%

How many job openings are expected?

Occupations in the Legal and Protective Services career field will generate more than 67,000 job openings over the decade. These job openings will result in part from the creation of about 27,400 new jobs. The remaining openings will be replacements for current workers.

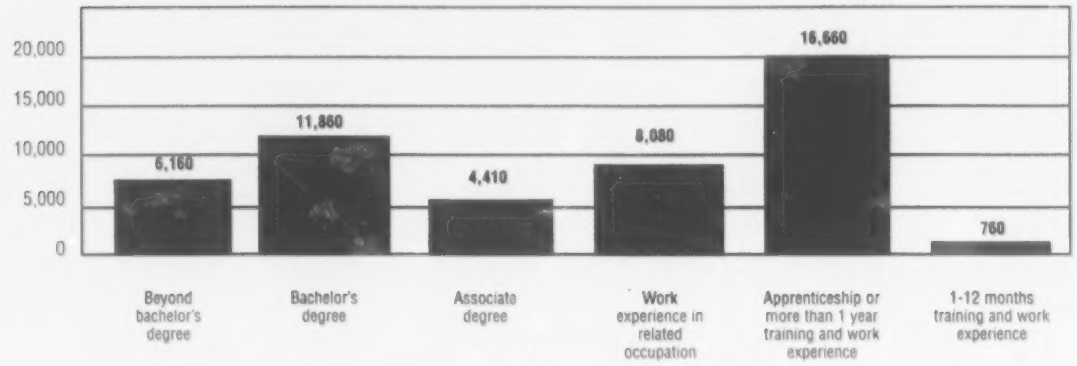
The 10 occupations expected to have the most job openings will provide a total of about 58,400 jobs, or 87.1 percent of all openings expected for the Legal and Protective Services career field.

The occupation expected to have the most openings is guards, with 12,450 jobs. The remaining occupations will provide about 1,900 to 11,700 openings each.

Ten Legal and Protective Services Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	Guards	12,450
2.	All Other Professional, Paraprofessional and Technical Workers	11,680
3.	Police Patrol Officers	8,830
4.	All Other Protective Service Workers	6,100
5.	Lawyers	5,720
6.	Fire Fighters	4,160
7.	Correction Officers and Jailers	2,860
8.	Paralegal and Legal Assistants	2,440
9.	Inspectors and Compliance Officers	2,300
10.	Detectives and Investigators, Except Public	1,870

Legal and Protective Services Total Job Openings, 1998-2008, by Education and Training Levels



What education and training are required?

Occupations in the Legal and Protective Services career field require various education and training levels. Nearly 11,900 openings will occur in occupations requiring a bachelor's degree, primarily for certain professional, paraprofessional and technical workers.

An additional 6,160 openings will occur in occupations requiring education beyond a bachelor's degree; most of these openings are for lawyers.

The largest number of openings, 16,660, will be in occupations requiring an apprenticeship or more than one year of training and work experience. Most of these openings will be for police patrol officers, fire fighters, and correction officers and jailers.

About 8,000 openings will occur in occupations requiring work experience in a related occupation. The bulk of these openings will be for inspectors and compliance officers, private detectives and investigators, and police and detective supervisors.

There will also be large numbers of openings in occupations requiring only brief training. Most of these openings will be for guards, and other protective service workers.

How much do the jobs pay?

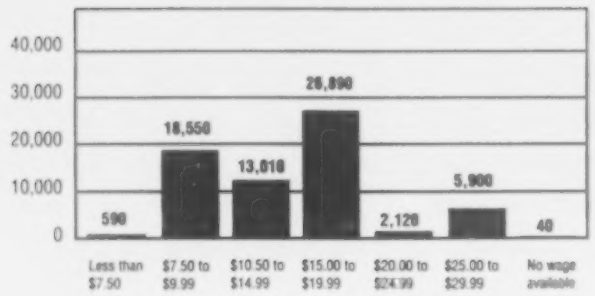
The largest number of job openings in the Legal and Protective Services career field will be in occupations with average wages of $15 to $19.99 per hour in 1998. Most of these nearly 26,900 openings are for certain professional, paraprofessional and technical workers, and police patrol officers.

An additional 5,900 openings will exist in occupations with average hourly wages of more than $25 in 1998. Most of these openings are for lawyers.

About 18,550 openings are projected for occupations with 1998 average hourly wages of $7.50 to $9.99. These openings are for guards, and all other protective service workers.

There will be more than 13,000 openings in occupations with 1998 average hourly wages of $10 to $14.99. The majority of these openings are for fire fighters, correction officers and jailers, paralegal and legal assistants, and private detectives and investigators.

Legal and Protective Services
Total Job Openings, 1998-2008,
by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Legal and Protective Services career field are found in local government, legal services, and private businesses that provide guard and security services. Also, about one-third of lawyers are self-employed.

Where can I find more information?

Ohio's labor market information system at **lmi.state.oh.us** and the Occupational Outlook Handbook at **stats.bls.gov/ocohome.htm** are sources of additional information and links to Ohio and national job banks, career and occupational resources, and education and training opportunities.

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Legal and Protective Services Careers

Data sources

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Work experience, plus a bachelor's or higher degree — Most occupations in this category are managerial occupations that require experience in a related nonmanagerial position.

Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

Associate degree — Completion of the degree program usually requires at least two years of full-time equivalent academic study.

Postsecondary vocational training — Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.

Work experience in a related occupation — Occupations requiring work experience include some supervisory or managerial jobs.

Apprenticeship or more than one year training and work experience — Some occupations generally require more than 12 months of on-the-job training, or combined work experience and formal classroom instruction, for workers to develop the skills needed for average job performance. This category includes formal and informal apprenticeships that may last up to four years and short-term intensive employer-sponsored training that workers must successfully complete. Individuals undergoing training are generally considered to be employed in the occupation. This category includes occupations in which workers may gain experience in non-work activities, such as professional athletes who gain experience through participation in athletic programs in academic institutions.

1 to 12 months training and work experience — This category pertains to occupations in which workers can develop the skills needed for average job performance after 1 to 12 months of combined on-the-job experience and informal training.

Center for Curriculum & Assessment

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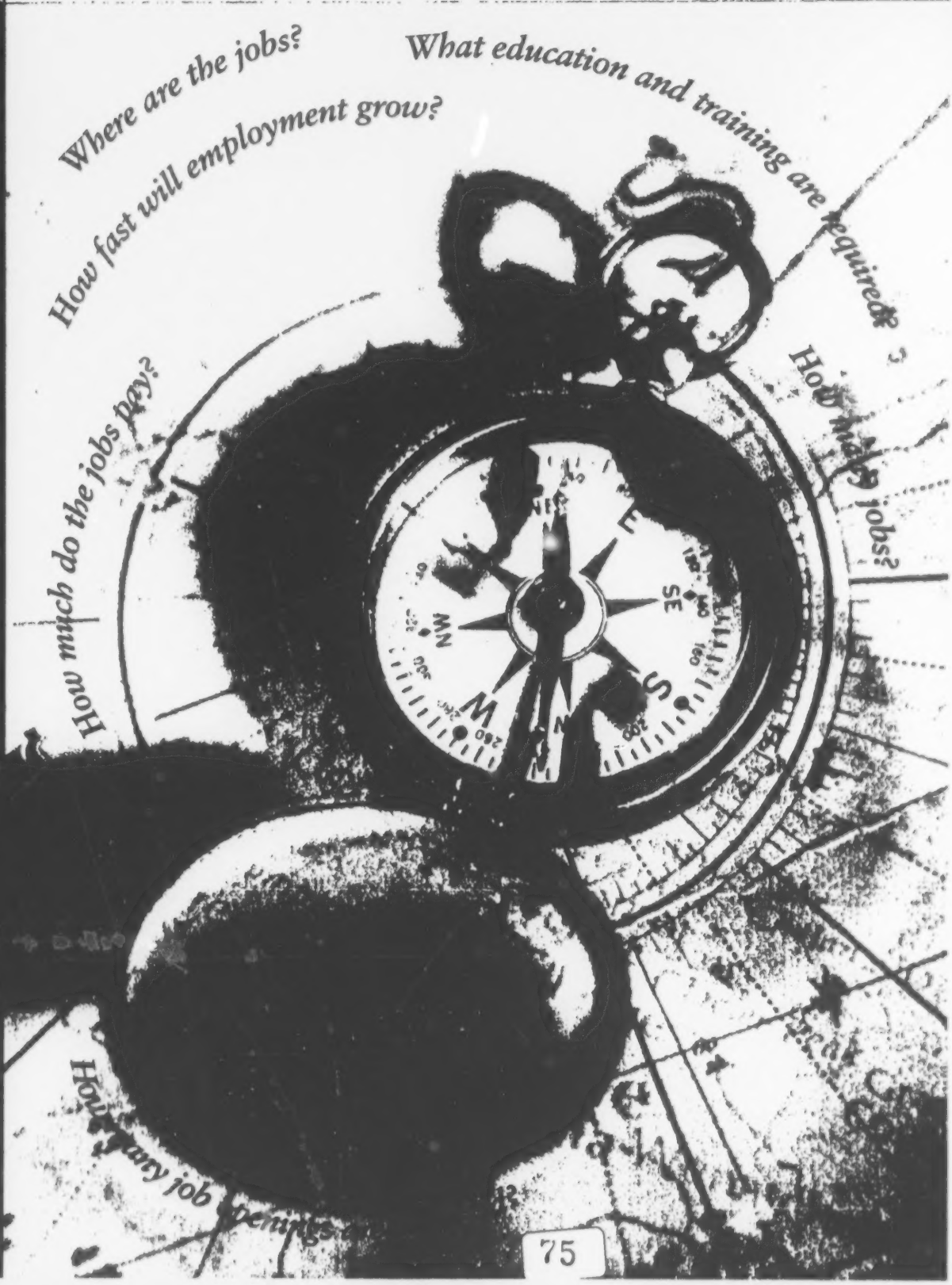
Arts and Entertainment Careers

Arts and Communication Career Cluster


Where are the jobs?
How fast will employment grow?
What education and training are required?
How many jobs?
How much do the jobs pay?

Arts and Entertainment Careers

The Arts and Entertainment career field primarily includes careers as designers, artists, entertainers, musicians, writers, and athletes. This is one of several career fields in Arts and Communications.

How many jobs?

In 1998, there were about 65,200 jobs in Ohio in the Arts and Entertainment career field. The 10 largest occupations range from more than 14,500 jobs for commercial, graphics and other designers to about 1,700 jobs for interior designers.

Ten Largest Arts and Entertainment Occupations

	Occupations	1998 Employment
1.	Commercial, Graphics and Other Designers	14,590
2.	Artists and Commercial Artists	12,690
3.	All Other Engineering Technicians	9,960
4.	Writers and Editors	8,240
5.	Music Directors, Singers, and Related Workers	4,220
6.	Instrumental Musicians	2,730
7.	Producers, Directors, Actors and Entertainers	2,170
8.	Athletes, Coaches, Umpires and Related Workers	2,000
9.	Technical Writers	1,990
10.	Interior Designers	1,720

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 18.5 percent, faster than the average rate of 12.5 percent for all occupations in the state.

The 10 fastest-growing occupations in the Arts and Entertainment career field include three with job growth at more than double the average rate: technical writers; athletes, coaches, umpires and related workers; and producers, directors, actors and entertainers. The remaining 10 fastest-growing occupations are expected to grow at above average rates.

Ten Fastest-Growing Arts and Entertainment Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Technical Writers	35.7%
2.	Athletes, Coaches, Umpires and Related Workers	28.5%
3.	Producers, Directors, Actors and Entertainers	25.3%
4.	Dancers and Choreographers	22.2%
5.	Commercial, Graphics and Other Designers	22.1%
6.	Artists and Commercial Artists	20.0%
7.	Interior Designers	19.8%
8.	Writers and Editors	19.7%
9.	Film Editors	17.9%
10.	Music Directors, Singers, and Related Workers	14.5%

How many job openings are expected?

Occupations in the Arts and Entertainment career field will generate more than 26,300 job openings over the decade. These job openings will result in part from the creation of about 12,000 new jobs. The remaining openings will be replacements for current workers.

The 10 occupations expected to have the most job openings will provide a total of more than 24,600 jobs, or 93.5 percent of all openings expected for the Arts and Entertainment career field.

The occupation expected to have the most openings is commercial, graphics and other designers, with 5,360 jobs. The remaining occupations will provide about 600 to 5,000 openings each.

What education and training are required?

Occupations in the Arts and Entertainment career field require various education and training levels. More than 11,000 openings will occur in occupations requiring a bachelor's degree, primarily for commercial, graphics and other designers; writers and editors; and technical writers.

Ten Arts and Entertainment Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	Commercial, Graphics and Other Designers	5,360
2.	Artists and Commercial Artists	5,160
3.	All Other Engineering Technicians	3,940
4.	Writers and Editors	3,800
5.	Music Directors, Singers, and Related Workers	1,420
6.	Athletes, Coaches, Umpires and Related Workers	1,280
7.	Technical Writers	1,230
8.	Producers, Directors, Actors and Entertainers	1,030
9.	Instrumental Musicians	800
10.	Interior Designers	590

An additional 5,370 openings will occur in occupations requiring education beyond a bachelor's degree; most of these openings are for artists and commercial artists.

Nearly 4,000 openings are expected for certain engineering technicians, a group which includes sound engineering technicians. These jobs require an associate degree.

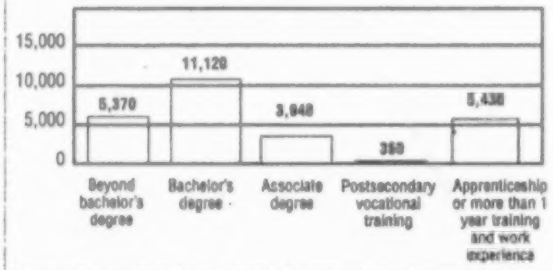
About 5,430 openings will occur in occupations requiring an apprenticeship or more than one year of training and work experience. The bulk of these openings will be for music directors, singers and related workers; athletes, coaches, umpires and related workers; and producers, directors, actors and entertainers.

There will also be a small numbers of openings for dancers and choreographers; these require postsecondary vocational training.

How much do the jobs pay?

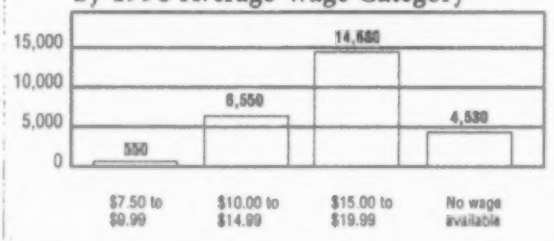
The largest number of job openings in the Arts and Entertainment career field will be in occupations with average wages of $15 to $19.99 per hour in 1998. Most of these 14,680 jobs are for commercial, graphics and other designers; certain engineering technicians; and writers and editors.

Arts and Entertainment Total Job Openings, 1998-2008, by Education and Training Level



There will be 6,550 openings in occupations with 1998 average hourly wages of $10 to $14.99. The majority of these openings are for artists and commercial artists. About 4,500 openings are expected in occupations for which there is no wage information available. These are primarily for self-employed occupations including music directors, singers and related workers; athlete, coach, umpire and related workers; and producers, directors, actors, and entertainers.

Arts and Entertainment Total Job Openings, 1998-2008, by 1998 Average Wage Category



Where are the jobs?

A large share of workers in the Arts and Entertainment career field are self-employed. Jobs are also found in advertising, religious organizations, sports organizations, amusement and recreation services, and schools and colleges.

Where can I find more information?

Ohio's labor market information system at **lmi.state.oh.us** and the Occupational Outlook Handbook at **stats.bls.gov/ocohome.htm** are sources of additional information and links to Ohio and national job banks, career and occupational resources, and education and training opportunities.

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Arts and Entertainment Careers

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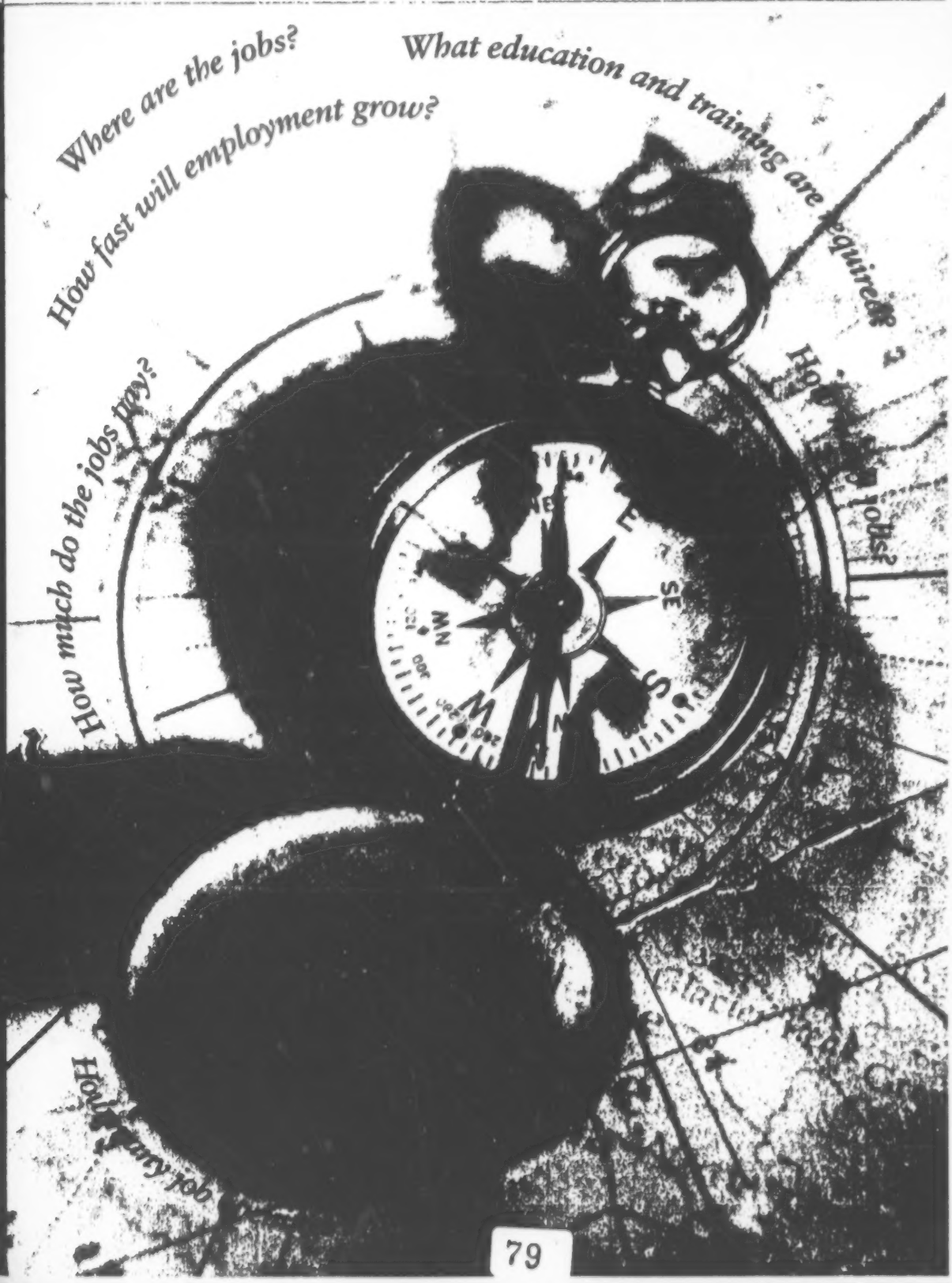
Media and Journalism Careers


Where are the jobs?
How fast will employment grow?
What education and training are required?
How much do the jobs pay?
How many jobs?
How to get a job

Media and Journalism Careers

The Media and Journalism career field includes a variety of jobs in the communications industry. This is one of several career fields in Arts and Communication.

How many jobs?

In 1998, there were more than 51,000 jobs in Ohio in the Media and Journalism career field. The largest occupation, for certain professional, paraprofessional and technical workers, provided nearly 27,600 jobs. There were 7,100 jobs for communication, transportation and utility managers, and about 6,100 jobs for the occupation of photographers.

Media and Journalism Occupations Ranked by 1998 Employment

Occupation	1998 Employment
All Other Professional, Paraprofessional and Technical Workers	27,590
Communication, Transportation and Utility Managers	7,100
Photographers	6,120
Reporters and Correspondents	2,370
Photographic Process Workers	1,980
Radio and TV Announcers	1,780
Broadcast Technicians	1,660
Photographic Processing Machine Operators	1,580
TV and Movie Camera Operators	500
Radio Operators	190
Broadcast News Analysts	130
All Other Announcers	110

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 11.6 percent, about as fast as the projected average rate of 12.5 percent for all occupations in the state. The occupation of television and movie camera operators will grow at more than twice the average at 30 percent. Several occupations in the Media and Journalism career field will have negative job growth; these include the occupations of photographers; reporters and correspondents; radio and television announcers; and photographic processing machine operators.

Media and Journalism Occupations Ranked by Job Growth Rate, 1998-2008

Occupation	Job Growth Rate
TV and Movie Camera Operators	30.0%
All Other Professional, Paraprofessional and Technical Workers	18.2%
All Other Announcers	18.2%
Communication, Transportation and Utility Managers	13.2%
Broadcast Technicians	7.8%
Broadcast News Analysts	7.7%
Photographic Process Workers	2.5%
Radio Operators	0.0%
Photographers	-0.7%
Reporters and Correspondents	-1.3%
Radio and TV Announcers	-5.6%
Photographic Processing Machine Operators	-13.9%

How many job openings are expected?

Occupations in the Media and Journalism career field will generate about 18,350 job openings over the decade, including nearly 6,000 new jobs. The remainder will be replacements for current workers.

The occupation expected to have the largest number of job openings is the category of certain professional, paraprofessional and technical workers, with 11,680 jobs.

Media and Journalism Occupations Ranked by Total Job Openings, 1998-2008

Occupation	Total Job Openings
All Other Professional, Paraprofessional and Technical Workers	11,680
Communication, Transportation and Utility Managers	2,180
Photographers	900
Photographic Process Workers	840
Reporters and Correspondents	750
Photographic Processing Machine Operators	630
Broadcast Technicians	590
Radio and TV Announcers	420
TV and Movie Camera Operators	220
All Other Announcers	50
Radio Operators	50
Broadcast News Analyst	40

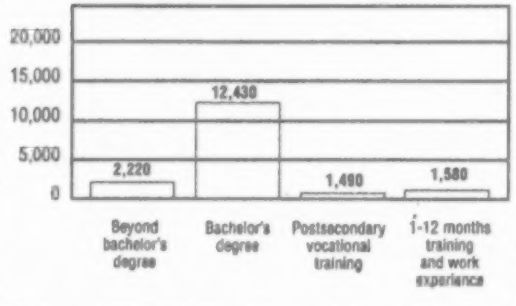
What education and training are required?

More than one-half of the job openings expected over the 1998-2008 decade, or 12,430 openings, will be in occupations requiring a bachelor's degree. Most of the openings are for professional, paraprofessional and technical workers.

The occupations requiring more than a bachelor's degree – communication, transportation and utility managers, and broadcast news analysts — will provide more than 2,200 job openings during the decade.

Nearly 1,500 job openings are expected in two occupations requiring postsecondary vocational training: photographers and broadcast technicians.

Media and Journalism
Total Job Openings, 1998-2008,
by Education and Training Level

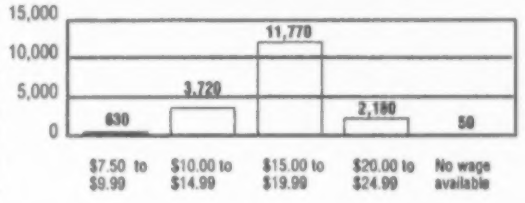


How much do the jobs pay?

The largest number of job openings in the Media and Journalism career field will be in occupations with average hourly wages of $15 to $19.99 in 1998. Most of the openings are for professional, paraprofessional and technical workers. Nearly 2,200 openings will exist in the occupation of communication, transportation and utility managers, which had 1998 average hourly wages of $20 to $24.99.

Another 3,720 job openings are expected in a variety of occupations with 1998 hourly wages of $10 to $14.99, including photographers, reporters and correspondents, and broadcast technicians.

Media and Journalism
Total Job Openings, 1998-2008,
by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Media and Journalism career field are found in radio and television broadcasting and photographic studios. In addition, many workers in this field are self-employed.

Where can I find more information?

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Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

Associate degree — Completion of the degree program usually requires at least two years of full-time equivalent academic study.

Postsecondary vocational training — Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.

Work experience in a related occupation — Occupations requiring work experience include some supervisory or managerial jobs.

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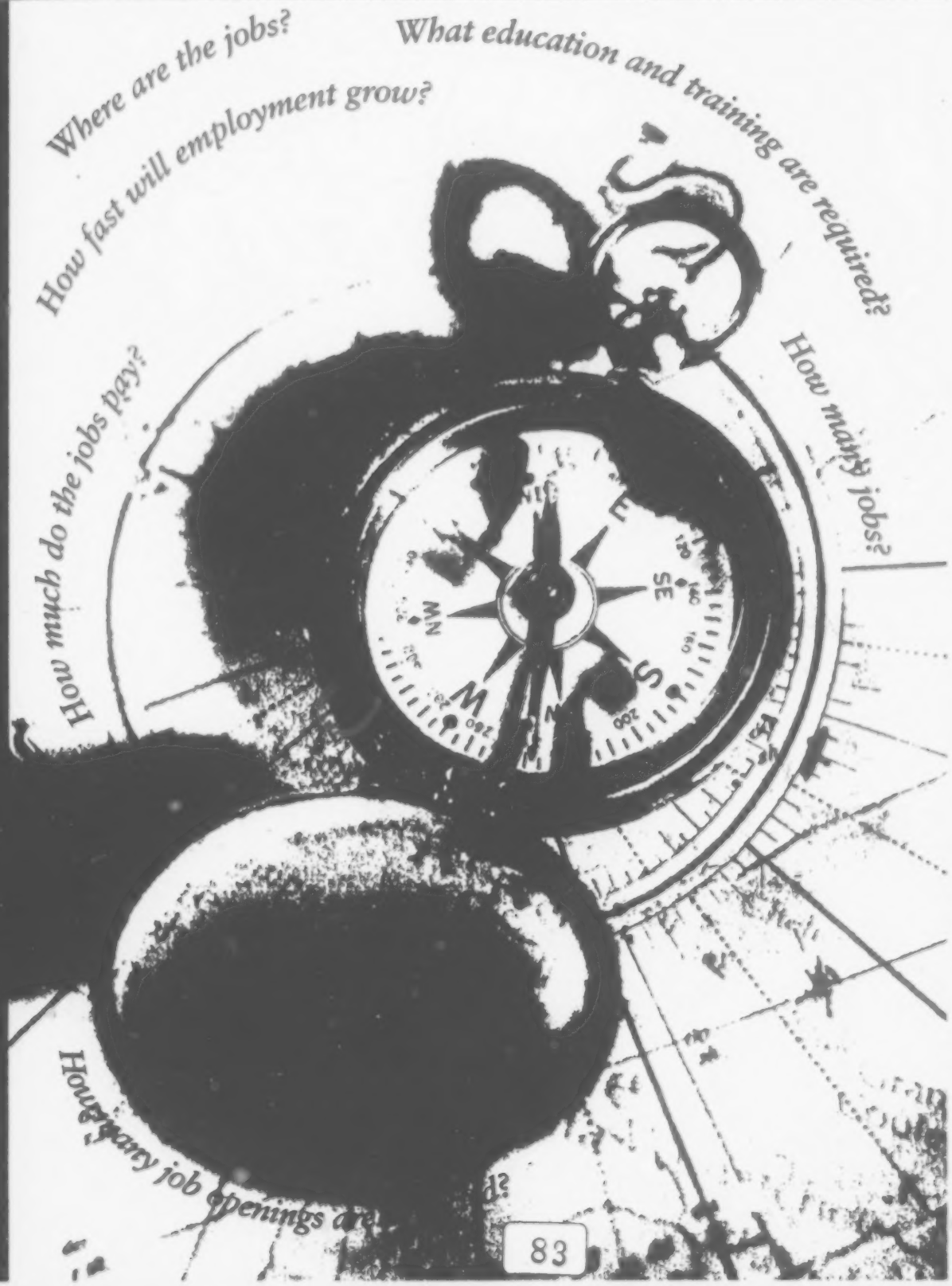
Auto and Truck Transport Careers


Where are the jobs?
What education and training are required?
How fast will employment grow?
How much do the jobs pay?
How many jobs?
How many job openings are

Auto and Truck Transport Careers

The Auto and Truck Transport career field includes careers as automobile, bus and truck drivers and mechanics, auto body repairers, and supervisors. This is one of several Industrial and Engineering career fields.

How many jobs?

In 1998, there were about 317,500 jobs in Ohio in the Auto and Truck Transport career field. The 10 largest occupations range from 73,750 jobs for heavy truck drivers to about 9,400 jobs for some first-line supervisors.

Ten Largest Auto and Truck Transport Occupations

	Occupation	1998 Employment
1.	Heavy Truck Drivers	73,750
2.	Light Truck Drivers	59,540
3.	Automotive Mechanics and Service Technicians	32,620
4.	School Bus Drivers	20,350
5.	First-Line Supervisors of Mechanics and Repairers	17,940
6.	Drivers/Sales Workers	15,190
7.	Bus, Truck and Diesel Engine Mechanics	14,270
8.	Vehicle Washers and Equipment Cleaners	13,580
9.	Automotive Body and Related Repairers	10,510
10.	All Other First-Line Supervisors	9,420

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 14 percent, similar to the average rate of 12.5 percent for all occupations in the state.

The 10 fastest-growing occupations in the Auto and Truck Transport career field includes one with job growth at about double the average rate: mobile home installers and repairers. The remaining 10 fastest-growing occupations are expected to grow at above average rates.

Ten Fastest-Growing Auto and Truck Transport Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Mobile Home Installers and Repairers	29.5%
2.	Bicycle Repairers	23.8%
3.	Vehicle Washers and Equipment Cleaners	22.2%
4.	Light Truck Drivers	20.3%
5.	Heavy Truck Drivers	18.0%
6.	Motorcycle Mechanics	15.8%
7.	First-Line Supervisors of Helpers and Laborers	15.2%
8.	School Bus Drivers	13.4%
9.	Automotive Body and Related Repairers	13.1%
10.	Mechanic and Repairer Helpers	12.9%

How many job openings are expected?

Occupations in the Auto and Truck Transport career field will generate nearly 113,000 job openings over the decade. These job openings will result in part from the creation of about 44,600 new jobs. The remaining openings will be replacements for current workers.

The 10 occupations expected to have the most job openings in the Auto and Truck Transport career field will provide a total of nearly 95,000 jobs, or 84 percent of all expected openings.

The occupation expected to have the most openings is heavy truck drivers, with 23,850 jobs. The remaining occupations will provide about 3,700 to 20,600 openings each.

Ten Auto and Truck Transport Occupations with the Most Job Openings, 1998-2008

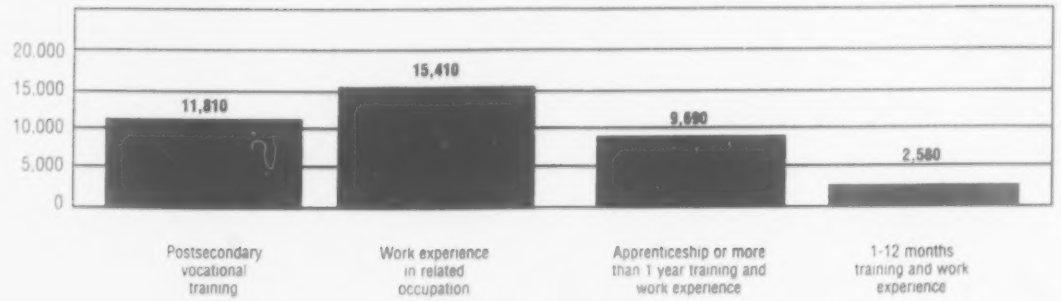
	Occupation	Total Job Openings
1.	Heavy Truck Drivers	23,850
2.	Light Truck Drivers	20,640
3.	Automotive Mechanics and Service Technicians	11,810
4.	Vehicle Washers and Equipment Cleaners	7,300
5.	First-Line Supervisors of Mechanics and Repairers	6,900
6.	School Bus Drivers	6,360
7.	Mechanic and Repairer Helpers	5,330
8.	Bus, Truck and Diesel Engine Mechanics	4,460
9.	Automotive Body and Related Repairers	4,450
10.	All Other First-Line Supervisors	3,670

What education and training are required?

Occupations in the Auto and Truck Transport career field require various education and training levels. About 11,800 openings will occur in the occupation of automotive mechanics and service technicians, which requires postsecondary vocational training.

The largest number of openings, about 15,400, will occur in occupations requiring work experience in a related occupation; most of these openings are for first-line supervisors.

Auto and Truck Transport Total Job Openings, 1998-2008, by Education and Training Levels



An additional 9,690 openings are expected in occupations requiring an apprenticeship or more than one year of training and work experience. Most of these openings will be for bus, truck, diesel engine mechanics, and automotive body and related repairers.

About 2,600 openings will occur in occupations requiring one to 12 months of training and work experience. The bulk of these openings will be for transit and intercity bus drivers.

There will also be large numbers of openings in occupations requiring only brief training. Most of these openings will be for truck drivers.

How much do the jobs pay?

The largest number of job openings in the Auto and Truck Transport career field will be in occupations with average wages of $10 to $14.99 per hour in 1998. Most of these nearly 72,000 openings are for truck drivers, and automotive mechanics and service technicians.

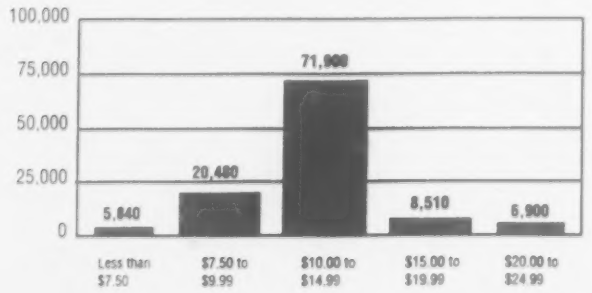
An additional 20,480 openings will exist in occupations with average hourly wages of $7.50 to $9.99 in 1998. Most of these openings are for vehicle washers and equipment cleaners, school bus drivers, and mechanic and repairer helpers.

About 8,500 openings are projected for occupations with 1998 average hourly wages of $15 to $19.99. These openings are for a variety of first-line supervisors.

There also will be nearly 7,000 openings for first-line supervisors of mechanics and repairers, with 1998 average hourly wages of $20 to $24.99.

Occupations with average hourly wages of less than $7.50 in 1998 should provide about 5,000 openings, primarily for service station attendants, taxi drivers and chauffeurs, and bicycle repairers.

Auto and Truck Transport Total Job Openings, 1998-2008, by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Auto and Truck Transport career field are found in local and long distance trucking businesses, motor vehicle dealers, automotive repair shops, motor vehicles parts and supplies stores, education and local government. In addition, many workers in this field are self-employed.

Where can I find more information?

Ohio's labor market information system at **lmi.state.oh.us** and the Occupational Outlook Handbook at **stats.bls.gov/ocohome.htm** are sources of additional information and links to Ohio and national job banks, career and occupational resources, and education and training opportunities.

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Auto and Truck Transport Careers

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Work experience, plus a bachelor's or higher degree — Most occupations in this category are managerial occupations that require experience in a related nonmanagerial position.

Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

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Postsecondary vocational training — Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.

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Apprenticeship or more than one year training and work experience — Some occupations generally require more than 12 months of on-the-job training, or combined work experience and formal classroom instruction, for workers to develop the skills needed for average job performance. This category includes formal and informal apprenticeships that may last up to four years and short-term intensive employer-sponsored training that workers must successfully complete. Individuals undergoing training are generally considered to be employed in the occupation. This category includes occupations in which workers may gain experience in non-work activities, such as professional athletes who gain experience through participation in athletic programs in academic institutions.

1 to 12 months training and work experience — This category pertains to occupations in which workers can develop the skills needed for average job performance after 1 to 12 months of combined on-the-job experience and informal training.

Center for Curriculum & Assessment

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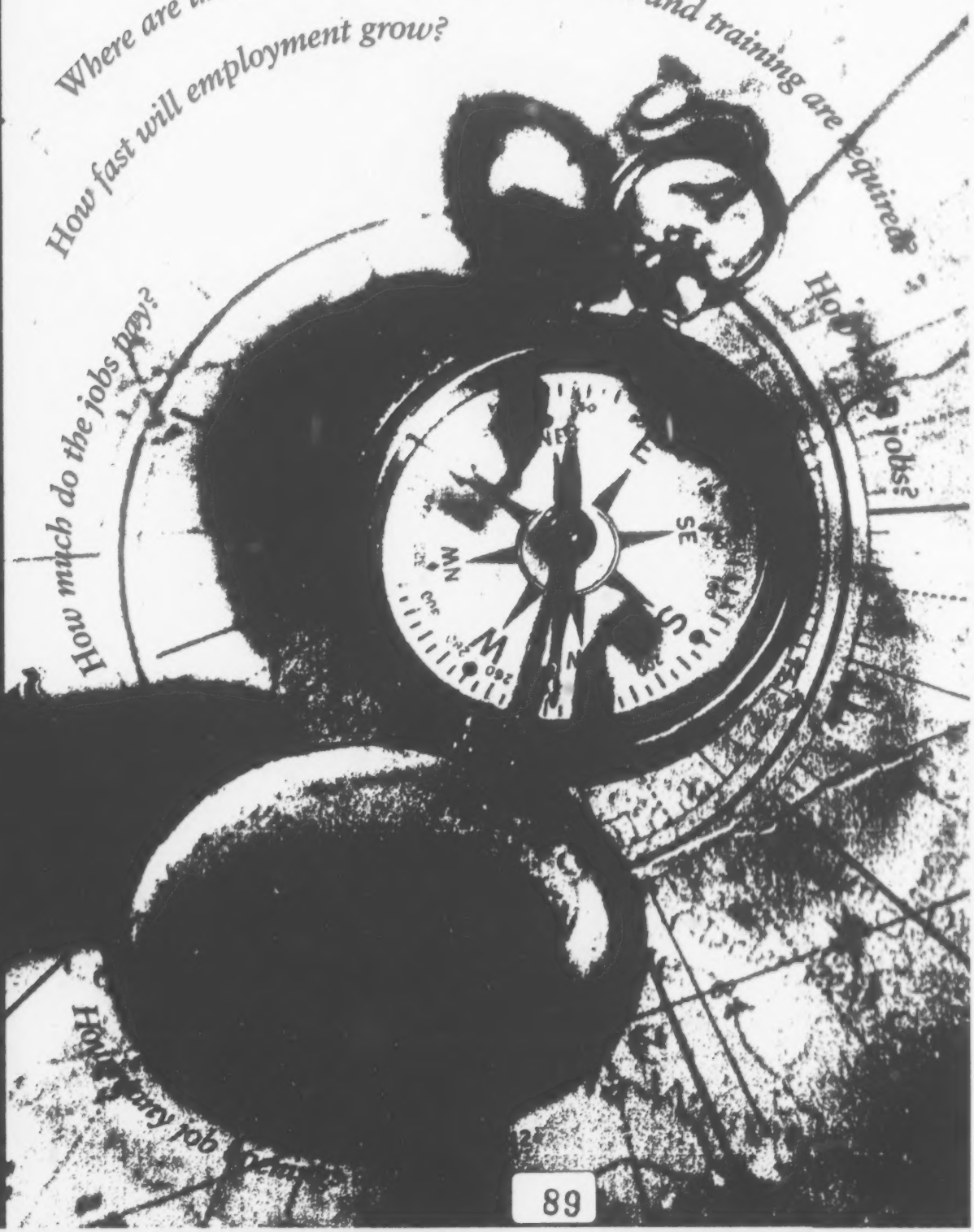
Transportation Systems Design and Management Careers


Where are the jobs?
How fast will employment grow?
What education and training are required?
How much do the jobs pay?
How many jobs?

Transportation Systems Design and Management Careers

The Transportation Systems Design and Management career field includes careers in the design and management of highways, urban transit systems, airports, trucking systems, and railroads. This is one of several Industrial and Engineering career fields.

How many jobs?

In 1998, there were nearly 37,000 jobs in Ohio in the Transportation Systems Design and Management career field. The largest occupation was drafters, with 12,380 jobs, followed by inspectors and compliance officers with 8,730 jobs and communication, transportation and utility managers with 7,100 jobs. The occupation of civil engineers, including traffic engineers, had a 1998 employment of 5,520.

Transportation Systems Design and Management Occupations Ranked by Employment

Occupation	1998 Employment
Drafters	12,380
Inspectors and Compliance Officers	8,730
Communication, Transportation and Utility Managers	7,100
Civil Engineers, including Traffic Engineers	5,520
Civil Engineering Technicians	2,620
Transportation Inspectors	400
Traffic Technicians	130

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by about 10 percent, about as fast as the projected average rate of 12.5 percent for all occupations in the state. Three occupations that will grow faster than average are civil engineering technicians, civil engineers including traffic engineers, and communication, transportation and utility managers.

Transportation Systems Design and Management Occupations Ranked by Job Growth Rate, 1998-2008

Occupation	Job Growth Rate
Civil Engineering Technicians	18.7%
Civil Engineers, including Traffic Engineers	17.8%
Communication, Transportation and Utility Managers	13.2%
Inspectors and Compliance Officers	8.1%
Drafters	5.2%
Traffic Technicians	0.0%
Transportation Inspectors	-7.5%

How many job openings are expected?

Occupations in the Transportation Systems Design and Management career field will generate about 11,400 job openings over the decade, including more than 3,700 new jobs. The remaining openings will be replacements for current workers.

The occupation of drafters will provide the most openings over the decade with 3,610 total job openings. The occupation of inspectors and compliance officers is expected to have 2,300 job openings, followed closely by communication, transportation and utility managers with 2,180 openings, and civil engineers, including traffic engineers, with 2,040 openings.

Transportation Systems Design and Management Occupations Ranked by Total Job Openings, 1998-2008

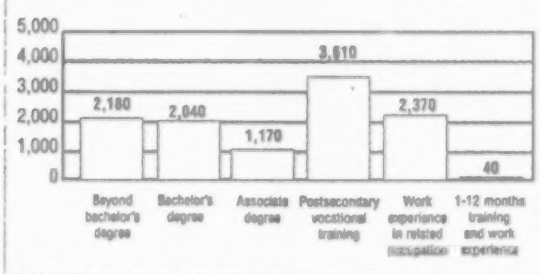
Occupation	Total Job Openings
Drafters	3,610
Inspectors and Compliance Officers	2,300
Communication, Transportation and Utility Managers	2,180
Civil Engineers, including Traffic Engineers	2,040
Civil Engineering Technicians	1,170
Transportation Inspectors	70
Traffic Technicians	40

What education and training are required?

More than 4,200 job openings expected over the 1998-2008 decade will be in occupations requiring at least a bachelor's degree. The occupations are communication, transportation and utility managers, and civil engineers, including traffic engineers. Another 1,170 openings will occur in the occupation of civil engineering technicians, which requires an associate degree.

There will be more than 3,600 job openings for the occupation of drafters, which calls for postsecondary vocational training. An additional 2,370 openings for inspectors and compliance officers and transportation inspectors require work experience in a related occupation.

Transportation Systems Design and Management Total Job Openings, 1998-2008, by Education and Training Level

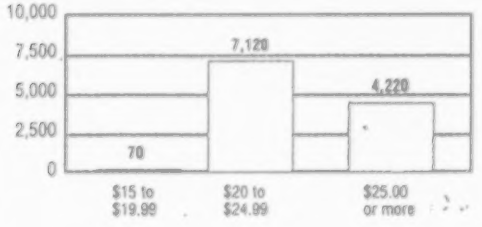


How much do the jobs pay?

The largest number of job openings in the Transportation Systems Design and Management career field will be in occupations with average hourly wages of $15 to $19.99 in 1998. The majority of the 7,120 openings are for drafters, inspectors and compliance officers, and civil engineering technicians.

There also will be more than 4,200 job openings paying $20 to $24.99 in 1998 average hourly wages. These openings are for communication, transportation and utility managers, and civil engineers.

Transportation Systems Design and Management Total Job Openings, 1998-2008, by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Transportation Systems Design and Management career field are found in engineering and architectural services, state and local government, air carriers, businesses that arrange freight transportation, and railroads.

Where can I find more information?

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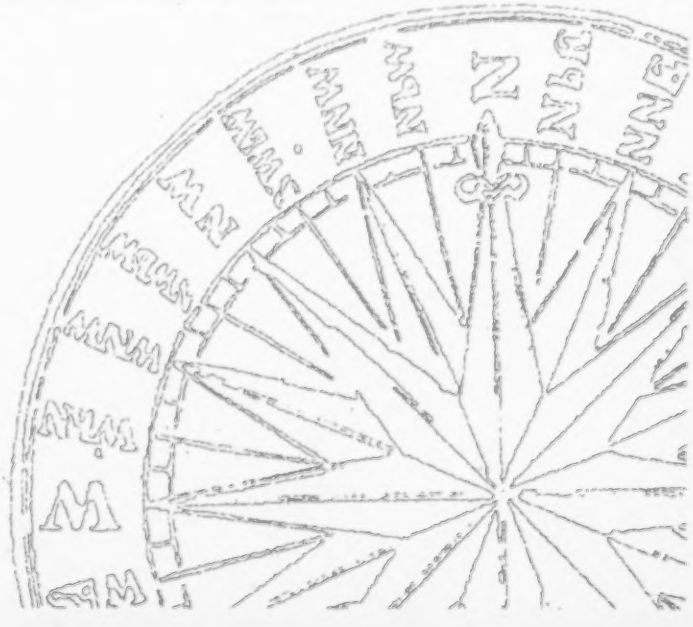

Transportation Systems Design and Management Careers

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Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

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Postsecondary vocational training — Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.

Work experience in a related occupation — Occupations requiring work experience include some supervisory or managerial jobs.

Apprenticeship or more than one year training and work experience — Some occupations generally require more than 12 months of on-the-job training, or combined work experience and formal classroom instruction, for workers to develop the skills needed for average job performance. This category includes formal and informal apprenticeships that may last up to four years and short-term intensive employer-sponsored training that workers must successfully complete. Individuals undergoing training are generally considered to be employed in the occupation. This category includes occupations in which workers may gain experience in non-work activities, such as professional athletes who gain experience through participation in athletic programs in academic institutions.

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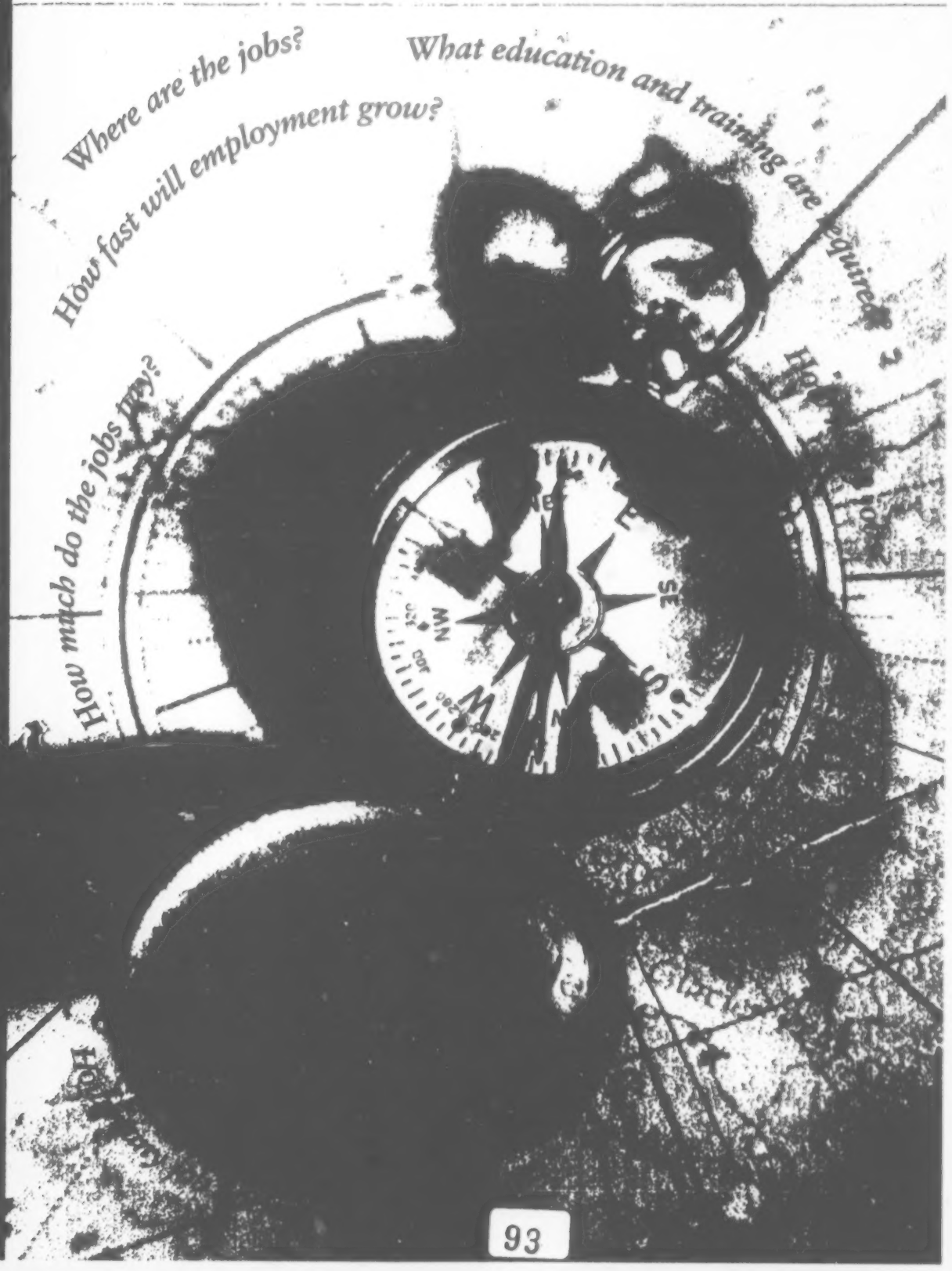
Industrial and Engineering Career Cluster

Manufacturing Engineering and Technology Careers



Manufacturing Engineering and Technology Careers

The Manufacturing Engineering and Technology career field includes careers in mechanical, electrical, industrial and chemical engineering, and in computer technology, biology, chemistry, and drafting. This is one of several Industrial and Engineering career fields.

How many jobs?

In 1998, there were about 101,500 jobs in Ohio in the Manufacturing Engineering and Technology career field. The largest occupations range from about 16,000 jobs for mechanical engineers, to 4,330 jobs for chemists.

Ten Largest Manufacturing Engineering and Technology Occupations

	Occupation	1998 Employment
1.	Mechanical Engineers	16,060
2.	Drafters	12,380
3.	Electrical and Electronic Engineers	11,020
4.	Electrical and Electronic Technicians	10,820
5.	Other Engineering Technicians	9,960
6.	Computer Engineers	8,530
7.	Industrial Engineers, Except Safety Engineers	8,420
8.	Mechanical Engineering Technicians	4,790
9.	Chemical Technicians, Except Health	4,530
10.	Chemists	4,330

How fast will employment grow?

Between 1998 and 2008, the number of jobs in the Manufacturing Engineering and Technology career field is expected to grow by nearly 19 percent, faster than the projected average rate of 12.5 percent for all occupations in the state. The 10 fastest-growing occupations include one that is expected to grow at nearly 10 times the rate for all occupations: computer engineers. Additionally, the occupations of biological scientists, electrical and electronic engineers, and electrical and electronic technicians all are expected to grow faster than average.

Ten Fastest-Growing Manufacturing Engineering and Technology Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Computer Engineers	113.5%
2.	Biological Scientists	29.4%
3.	Electrical and Electronic Engineers	21.6%
4.	Electrical and Electronic Technicians	20.3%
5.	All Other Engineering Technicians	13.7%
6.	Mechanical Engineers	11.1%
7.	Mechanical Engineering Technicians	10.0%
8.	Industrial Engineers,Except Safety Engineers	6.1%
9.	Drafters	5.2%
10.	Chemical Engineers	4.9%

How many job openings are expected?

Occupations in the Manufacturing Engineering and Technology career field will generate nearly 40,000 job openings over the decade. About 19,000 of these openings will be new jobs, with the remainder resulting from the need to replace current workers.

The 10 occupations with the most openings account for more than 37,000 jobs over the decade, or 93.5 percent of the total number of openings in the field. The occupation with the largest number of expected openings, 10,210, is that of computer engineers. Also contributing large numbers of openings are the occupations of mechanical engineers, electrical and electronic engineers, electrical and electronic technicians, and drafters.

What education and training are required?

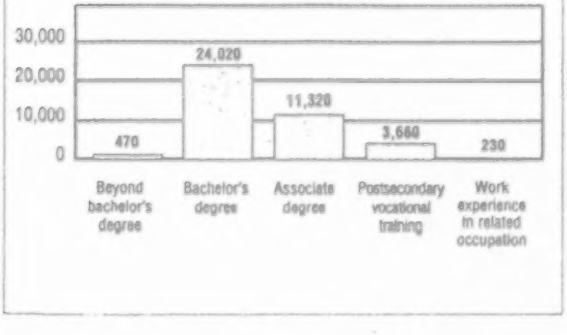
Occupations in the Manufacturing Engineering and Technology career field cover a wide range of education and training levels. More than one-half of expected openings is for occupations requiring at least a bachelor's degree, including computer engineers, mechanical engineers, and electrical and electronic engineers.

Ten Manufacturing Engineering and Technology Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	Computer Engineers	10,210
2.	Mechanical Engineers	4,890
3.	Electrical and Electronic Engineers	4,730
4.	Electrical and Electronic Technicians	4,410
5.	All Other Engineering Technicians	3,940
6.	Drafters	3,610
7.	Industrial Engineers, Except Safety Engineers	1,710
8.	Mechanical Engineering Technicians	1,460
9.	Chemists	1,110
10.	Chemical Technicians, Except Health	1,030

More than 11,300 openings are for occupations requiring an associate degree. Most of the openings will be for electrical and electronic technicians, other engineering technicians, mechanical engineering technicians and chemical technicians (except health). About 3,660 job openings are for occupations requiring postsecondary vocational training. Most of the openings are for drafters.

Manufacturing Engineering and Technology Total Job Openings, 1998-2008, by Education and Training Level



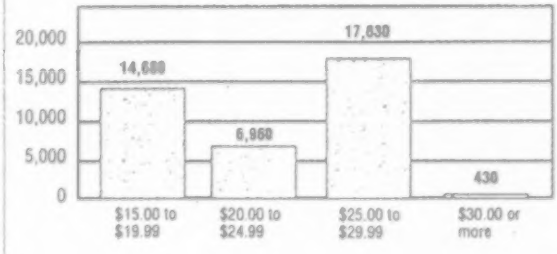
How much do the jobs pay?

The largest number of job openings in the Manufacturing Engineering and Technology career field will be in occupations with 1998 average hourly wages of more than $25. The majority of these 18,000 job openings will be for computer engineers with 10,210 openings. An additional 4,730 openings will be available for electrical and electronic engineers.

The next largest number of openings, 14,680, will be in occupations with 1998 average wages of $15 to $19.99 per hour. These openings will be spread among a number of occupations including electrical and electronic technicians and drafters.

Another 6,960 openings are projected for occupations with average wages of $20 to $24.99 per hour. The majority of these openings are for mechanical engineers.

Manufacturing Engineering and Technology Total Job Openings, 1998-2008, by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Manufacturing Engineering and Technology career field are found in engineering and architectural services, computer and data processing services, and businesses that manufacture motor vehicles, machinery, electronic components, computer and office equipment, chemicals and other products.

Where can I find more information?

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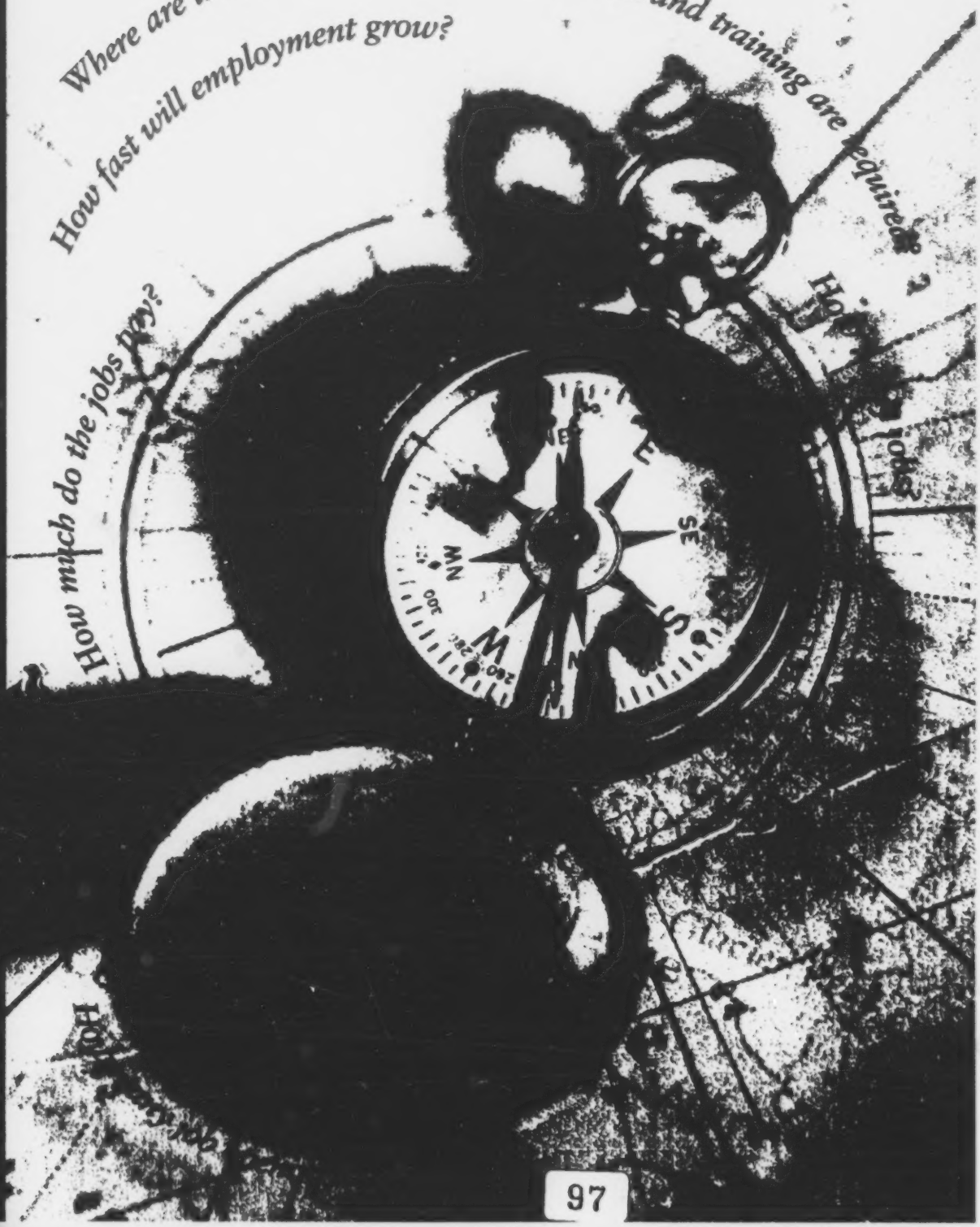
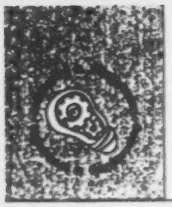
Precision Production Careers





Precision Production Careers

The Precision Production career field includes careers in metalworking and woodworking. This is one of several Industrial and Engineering career fields.

How many jobs?

In 1998, there were 64,670 jobs in Ohio in the Precision Production career field. The largest occupations range from 30,450 jobs for machinists to 830 jobs for boilermakers.

Ten Largest Precision Production Occupations

	Occupation	1998 Employment
1.	Machinists	30,450
2.	Tool and Die Makers	15,370
3.	Cabinet Makers and Bench Carpenters	3,770
4.	All Other Precision Workers	3,270
5.	Tool Grinders, Filers and Sharpeners	2,900
6.	Foundry Mold and Core Makers	1,400
7.	Molders and Shapers, Except Jewelry	1,380
8.	All Other Precision Metal Workers	1,240
9.	Furniture Finishers	1,140
10.	Boilermakers	830

How fast will employment grow?

Between 1998 and 2008, the number of jobs in the Precision Production career field is expected to grow by about 3 percent, more slowly than the projected average rate of 12.5 percent for all occupations in the state. The 10 fastest-growing occupations include three that are expected to grow about as fast as the average rate for all occupations: cabinet makers and bench carpenters, precision etchers and engravers, and all other precision workers.

Ten Fastest-Growing Precision Production Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	All Other Precision Workers	13.1%
2.	Cabinet Makers and Bench Carpenters	12.7%
3.	Precision Etchers and Engravers	11.1%
4.	All Other Precision Metal Workers	7.3%
5.	Fabric and Apparel Patternmakers and Layout Workers	6.3%
6.	Precision Metal Layout Workers	6.1%
7.	Precision Instrument Makers	5.6%
8.	Machinists	4.2%
9.	Boilermakers	2.4%
10.	Furniture Finishers	1.8%

How many job openings are expected?

Occupations in the Precision Production career field will generate about 15,600 job openings over the decade. Nearly 2,000 of these openings will be new jobs, with the remainder resulting from the need to replace current workers.

The 10 occupations with the most expected job openings over the decade account for nearly 15,000 openings, or 95.1 percent of the total number of openings in the field. The occupation of machinists is expected to have the largest number of openings, with 7,350. The occupation of tool and die makers will contribute nearly 3,000 job openings.

Ten Fastest-Growing Precision Production Occupations with the Most Job Openings, 1998-2008

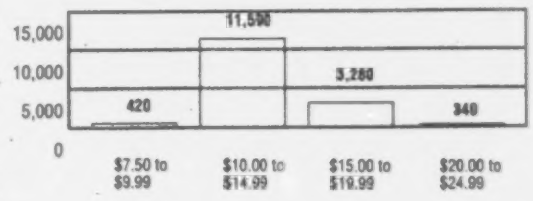
	Occupation	Total Job Openings
1.	Machinists	7,350
2.	Tool and Die Makers	2,840
3.	All Other Precision Workers	1,300
4.	Cabinet Makers and Bench Carpenters	910
5.	Tool Grinders, Filers and Sharpeners	760
6.	All Other Precision Metal Workers	390
7.	Foundry Mold and Core Makers	380
8.	Molders and Shapers, Except Jewelry	380
9.	Furniture Finishers	300
10.	Precision Metal Layout Workers	250

How much do the jobs pay?

The largest number of job openings in the Precision Production career field will be in occupations with 1998 average hourly wages of $10 to $14.99. The majority of the 11,590 job openings will be for machinists, with 7,350 openings. An additional 1,300 openings will be available for certain other precision workers, with 910 openings for cabinet makers and bench carpenters.

The next largest number of openings, 3,280, will be in occupations with 1998 average wages of $15 to $19.99 per hour. Most of these openings will be for tool and die makers.

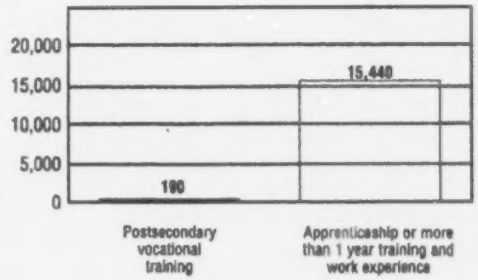
Precision Production Total Job Openings, 1998-2008, by 1998 Average Wage Category



What education and training are required?

Nearly all of the occupations in the Precision Production career field require an apprenticeship or more than one year of training and work experience. One occupation, jewelers and silversmiths, requires postsecondary vocational training.

Precision Production Total Job Openings, 1998-2008, by Education and Training Level



Where are the jobs?

Most jobs in the Precision Production career field are found in businesses that manufacture metalworking and industrial machinery, metal forgings and stampings, motor vehicles and equipment, and fabricated metal products.

Most Precision Production workers who work in wood are employed in businesses that produce millwork, plywood and structural wood products, and furniture. Many cabinet makers are self-employed.

Where can I find more information?

Ohio's labor market information system at lmi.state.oh.us and the Occupational Outlook Handbook at stats.bls.gov/ocohome.htm are sources of additional information and links to Ohio and national job banks, career and occupational resources, and education and training opportunities.

Check the Web site at www.ode.state.oh.us/ctae for more details about this and other career fields.

Precision Production Careers

Data sources

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Work experience, plus a bachelor's or higher degree — Most occupations in this category are managerial occupations that require experience in a related nonmanagerial position.

Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

Associate degree — Completion of the degree program usually requires at least two years of full-time equivalent academic study.

Postsecondary vocational training — Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.

Work experience in a related occupation — Occupations requiring work experience include some supervisory or managerial jobs.

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1 to 12 months training and work experience — This category pertains to occupations in which workers can develop the skills needed for average job performance after 1 to 12 months of combined on-the-job experience and informal training.

Center for Curriculum & Assessment

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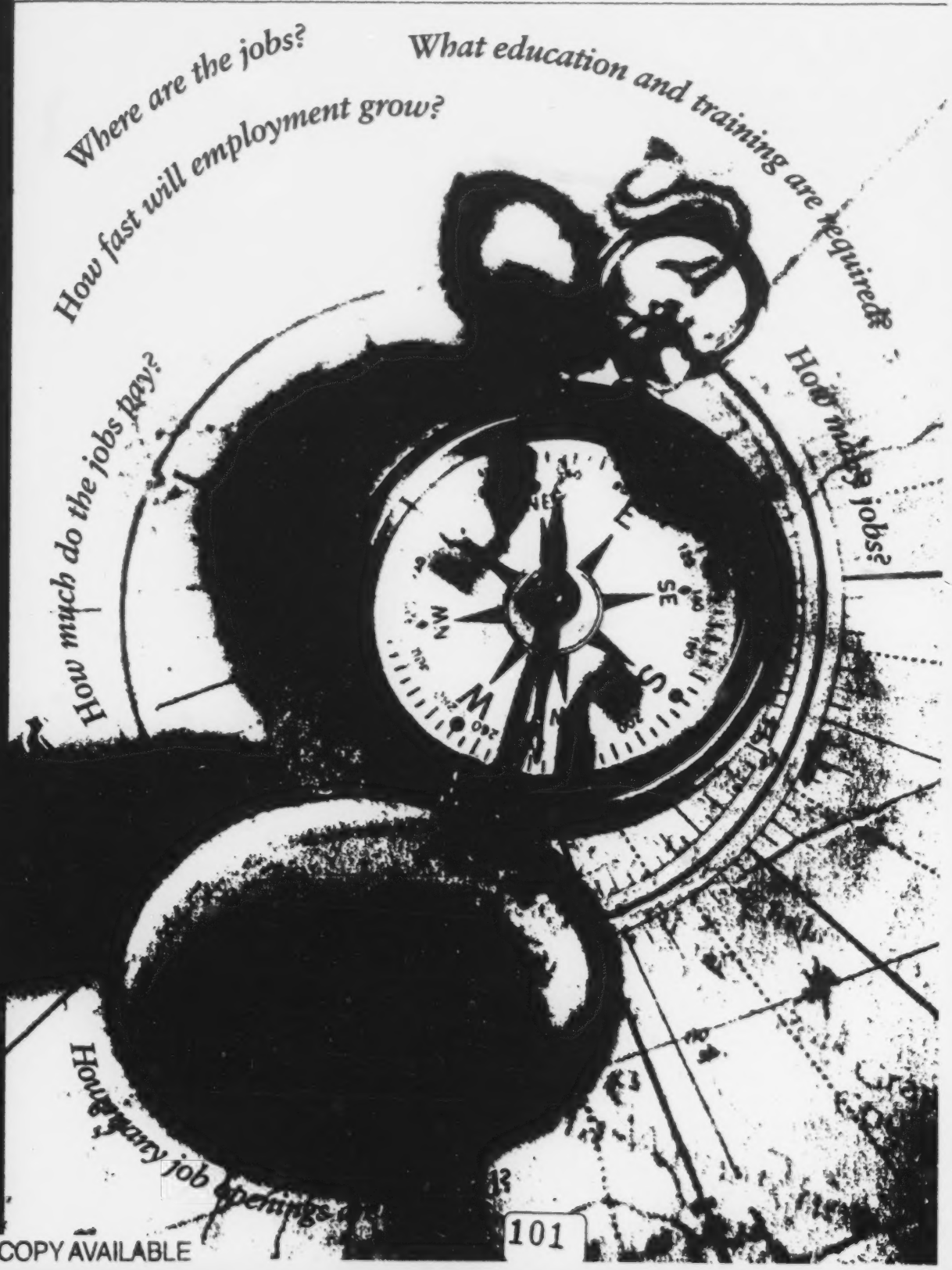
Production Maintenance, Setup and Operation Careers


Where are the jobs?
How fast will employment grow?
What education and training are required?
How many jobs?
How much do the jobs pay?
How many job openings?

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Production Maintenance, Setup and Operation Careers

The Production Maintenance, Setup and Operation career field includes a variety of occupations, primarily in manufacturing, such as machine operators and mechanics, welders, fabricators, and assemblers. This is one of several Industrial and Engineering career fields.

How many jobs?

In 1998, there were about 548,000 jobs in Ohio in the Production Maintenance, Setup and Operation career field. The 10 largest occupations range from 89,000 jobs for certain assemblers and fabricators, to around 11,700 jobs for metal and plastic machine tool cutting operators.

Ten Largest Production Maintenance, Setup and Operation Occupations

	Occupation	1998 Employment
1.	All Other Assemblers, Fabricators, Except Machine, Electrical, Electronic and Precision	89,170
2.	All Other Manual Workers	39,720
3.	All Other Machine Operators and Tenders	34,810
4.	Packaging and Filling Machine Operators and Tenders	18,480
5.	Welders and Cutters	18,110
6.	Machine Forming Operators, Metal and Plastic	17,990
7.	Industrial Machinery Mechanics	17,830
8.	All Other Mechanics and Installers	13,430
9.	Plastic Molding and Casting Operators and Tenders	12,500
10.	Machine Tool Cutting Operators, Metal and Plastic	11,710

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by 6 percent, more slowly than the average rate of 12.5 percent for all occupations in the state.

The 10 fastest-growing occupations in the Production Maintenance, Setup and Operation career field include two with job growth at more than double the average rate: central office and PBX installers and repairers, and telephone and cable television installers and repairers. The remaining 10 fastest-growing occupations are expected to grow at above average rates.

Ten Fastest-Growing Production Maintenance, Setup and Operation Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Central Office and PBX Installers and Repairers	34.6%
2.	Telephone and Cable TV Installers and Repairers	30.6%
3.	Painting, Coating and Decorating Workers, Hand	24.1%
4.	All Other Electrical and Electronic Equipment Mechanics, Installers and Repairers	23.6%
5.	Numerical Control Machine Tool, Metal and Plastic	21.8%
6.	Nonelectrolytic Plating Operators, Metal and Plastic	20.0%
7.	Electrolytic Plating Operators, Metal and Plastic	17.8%
8.	All Other Manual Workers	16.4%
9.	All Other Plant and System Occupations	16.3%
10.	All Other Metal and Plastic Machine Operators	15.8%

How many job openings are expected?

Occupations in the Production Maintenance, Setup and Operation career field will generate more than 166,000 job openings over the decade. These job openings will result in part from the creation of about 33,000 new jobs. The remaining openings will be replacements for current workers.

Fast rates of growth do not necessarily correspond with the greatest number of job openings. For instance, the 10 fastest-growing occupations in this career field account for only 21.5 percent of the projected openings for the decade.

However, when the occupations are ranked strictly by total number of job openings expected from 1998 to 2008, a slightly different list results. The 10 occupations with the most openings account for more than 84,500 job openings, or nearly 51 percent of the total number of openings in the field.

Ten Production Maintenance, Setup and Operation Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	All Other Assemblers, Fabricators, Except Machine, Electrical, Electronic and Precision	20,330
2.	All Other Manual Workers	17,210
3.	All Other Machine Operators and Tenders	8,720
4.	Packaging and Filling Machine Operators and Tenders	7,720
5.	Welders and Cutters	5,650
6.	Mechanic and Repairer Helpers	5,330
7.	Industrial Machinery Mechanics	5,170
8.	Telephone and Cable TV Installers and Repairers	4,990
9.	Plastic Molding and Casting Operators and Tenders	4,910
10.	Machine Forming Operators, Metal and Plastic	4,480

What education and training are required?

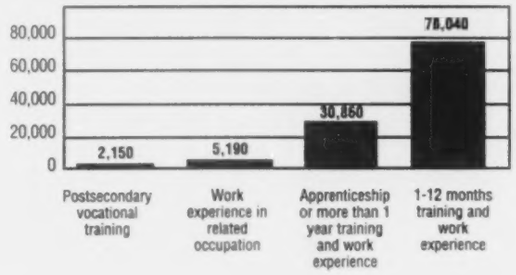
Occupations in the Production Maintenance, Setup and Operation career field require various education and training levels. The largest number of openings, about 78,000, will occur in occupations that require one to 12 months of training and work experience. Most of these openings are for machine operators and tenders.

An additional 30,860 openings are expected in occupations requiring an apprenticeship or more than one year of training and work experience. Most of these openings will be for welders and cutters, industrial machinery mechanics, telephone and cable television installers and repairers, and a variety of mechanics and installers.

About 5,200 openings will occur in occupations requiring work experience in a related occupation. These openings are primarily for machine builders and other precision assemblers. About 2,150 openings will occur in occupations requiring postsecondary vocational training. Nearly one-half of these openings will be for central office and PBX installers and repairers.

There will also be large numbers of openings in occupations requiring only brief training, primarily for certain assemblers and fabricators, and manual workers.

Production Maintenance, Setup and Operation Total Job Openings, 1998-2008, by Education and Training Level



How much do the jobs pay?

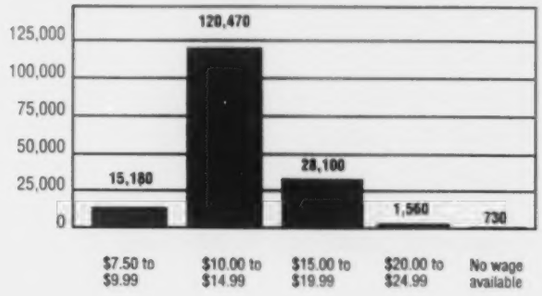
The largest number of job openings in the Production Maintenance, Setup and Operation career field will be in occupations with average wages of $10 to $14.99 per hour in 1998. Most of these 120,470 openings are for certain assemblers and fabricators, certain manual workers, machine operators and tenders, and welders and cutters.

About 28,000 openings are projected for occupations with 1998 average hourly wages of $15 to $19.99. These openings are primarily for industrial machinery mechanics, telephone and cable television installers and repairers, machine tool cutting operators, and millwrights.

An additional 15,180 openings will exist in occupations with average hourly wages of $7.50 to $9.99 in 1998. Most of these openings are for mechanic and repairer helpers, plastic molding and casting operators and tenders, and electrical and electronic assemblers.

There also will be more than 1,500 openings for occupations with 1998 average hourly wages of $20 to $24.99, primarily as central office and PBX installers and repairers.

Production Maintenance, Setup and Operation Total Job Openings, 1998-2008, by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Production Maintenance, Setup and Operation career field are found in businesses that manufacture motor vehicles and equipment, fabricated metal products, metal forgings and stampings, machinery, and plastics products.

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Production Maintenance, Setup and Operation Careers

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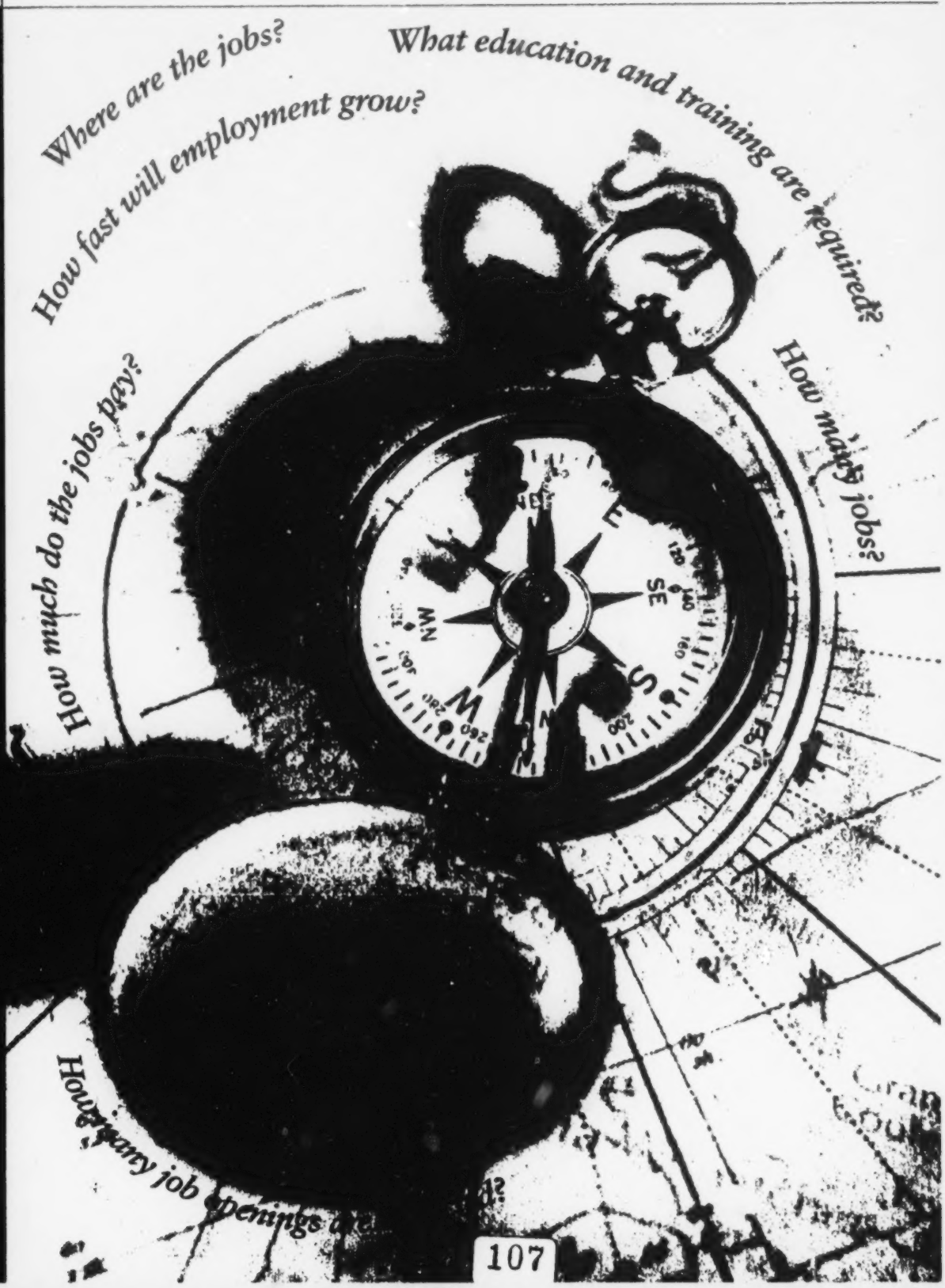
Engineering Careers



Engineering Careers

The Engineering career field includes technical, professional and management careers in a variety of engineering areas. This is one of several Industrial and Engineering career fields.

How many jobs?

In 1998, there were more than 123,000 jobs in Ohio in the Engineering career field. The largest occupations range from about 16,000 jobs for mechanical engineers to 5,220 jobs for sales engineers.

Ten Largest Engineering Occupations

	Occupation	1998 Employment
1.	Mechanical Engineers	16,060
2.	All Other Engineers	15,850
3.	Engineering, Mathematical and Natural Sciences Managers	13,740
4.	Electrical and Electronic Engineers	11,020
5.	Electrical and Electronic Technicians	10,820
6.	All Other Engineering Technicians	9,960
7.	Computer Engineers	8,530
8.	Industrial Engineers, Except Safety Engineers	8,420
9.	Civil Engineers, Including Traffic Engineers	5,520
10.	Sales Engineers	5,220

How fast will employment grow?

Between 1998 and 2008, the number of jobs in the Engineering career field is expected to grow by more than 23 percent, faster than the projected average rate of 12.5 percent for all occupations in the state. The 10 fastest-growing occupations include one that is expected to grow at nearly 10 times the rate for all occupations: computer engineers. The occupations of engineering and related managers, petroleum engineers, electrical and electronic engineers, postsecondary engineering teachers, electrical and electronic technicians, civil engineering technicians, and civil engineers all are expected to grow faster than average.

Ten Fastest-Growing Engineering Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Computer Engineers	113.5%
2.	Engineering, Mathematical and Natural Sciences Managers	34.8%
3.	Petroleum Engineers	25.0%
4.	Electrical and Electronic Engineers	21.6%
5.	Engineering Teachers, Postsecondary	20.8%
6.	Electrical and Electronic Technicians	20.3%
7.	All Other Engineers	18.9%
8.	Civil Engineering Technicians	18.7%
9.	Civil Engineers, Including Traffic Engineers	17.8%
10.	All Other Engineering Technicians	13.7%

How many job openings are expected?

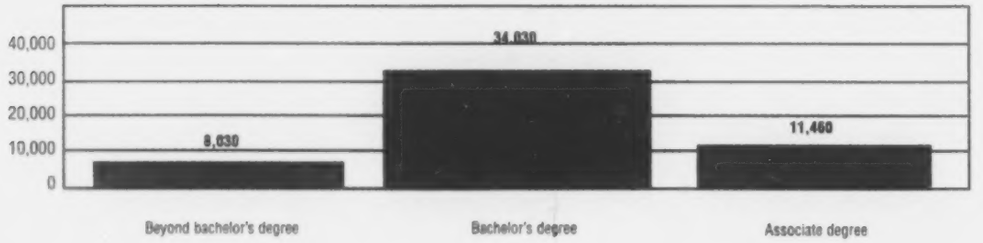
Occupations in the Engineering career field will generate more than 53,500 job openings over the decade. More than 28,400 of these openings will be new jobs, with the remainder resulting from the need to replace current workers.

The 10 occupations with the most expected job openings account for more than 48,000 openings over the decade, or 89.9 percent of the total number of openings in the field. The occupation with the largest number of expected openings, 10,210, is that of computer engineers. The occupation of engineering and related managers will generate about 7,200 job openings.

Ten Engineering Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	Computer Engineers	10,210
2.	All Other Engineers	7,500
3.	Engineering, Mathematical and Natural Sciences Managers	7,190
4.	Mechanical Engineers	4,890
5.	Electrical and Electronic Engineers	4,730
6.	Electrical and Electronic Technicians	4,410
7.	All Other Engineering Technicians	3,940
8.	Civil Engineers, Including Traffic Engineers	2,040
9.	Industrial Engineers, Except Safety Engineers	1,710
10.	Sales Engineers	1,520

Engineering Total Job Openings, 1998-2008, by Education and Training Levels



How much do the jobs pay?

The largest number of job openings in the Engineering career field will be in occupations with 1998 average hourly wages of $25 to $29.99. The largest segment of the 26,710 job openings will be for computer engineers, with 10,210 openings. An additional 4,730 openings will be available for electrical and electronic engineers.

More than 8,400 job openings will be in occupations with 1998 average hourly wages of $30 or more. Most of these openings are for engineering and related managers.

Nearly 11,000 job openings will be in occupations with 1998 average wages of $15 to $19.99 per hour. Most of these openings will be for electrical and electronic technicians, and other engineering technicians.

Another 7,410 openings are projected for occupations with 1998 average wages of $20 to $24.99 per hour. The majority of these openings is for mechanical engineers.

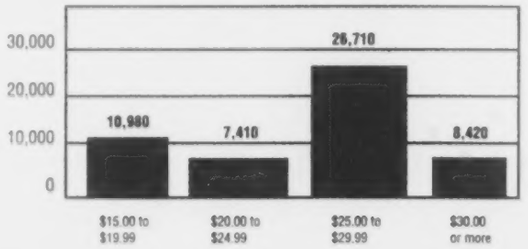
What education and training are required?

More than one-half of expected openings in the Engineering career field is for occupations requiring a bachelor's degree, including computer engineers, mechanical engineers, electrical and electronic engineers and civil engineers.

More than 11,400 openings are for occupations requiring an associate degree. Most of the openings will be for electrical and electronic technicians, other engineering technicians, mechanical engineering technicians and civil engineering technicians.

More than 8,000 job openings are for occupations requiring education beyond a bachelor's degree. Most of the openings are for engineering and related managers.

Engineering
Total Job Openings, 1998-2008,
by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Engineering career field are found in:

Businesses that provide engineering, architectural, or computer and data processing services.

State and local government.

Businesses that manufacture motor vehicles and equipment, electronic components and accessories, and computer and office equipment.

Where can I find more information?

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Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

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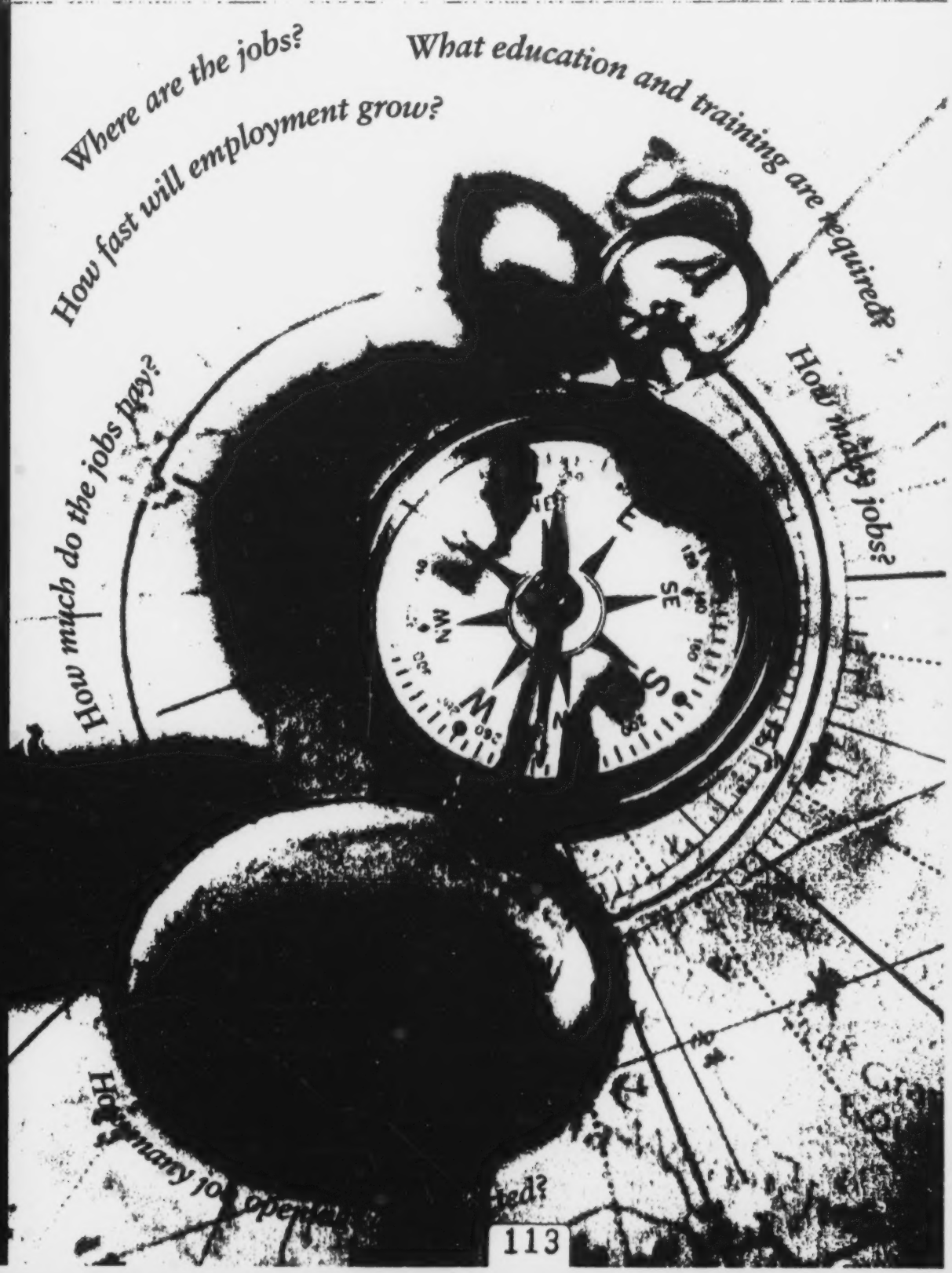
Architecture and Drafting Careers


Where are the jobs?
How fast will employment grow?
What education and training are required?
How much do the jobs pay?
How many jobs?
How many jobs are expected?

Architecture and Drafting Careers

The Architecture and Drafting career field includes careers in architectural and landscape services and education. This is one of several Industrial and Engineering career fields.

How many jobs?

In 1998, there were more than 21,000 jobs in Ohio in the Architecture and Drafting career field. The largest occupation was drafters with more than 12,000 jobs. There were 3,330 jobs for architects and nearly 2,400 jobs for surveying and mapping scientists.

Architecture and Drafting Occupations Ranked by 1998 Employment

Occupation	1998 Employment
Drafters	12,380
Architects, Except Landscape and Marine	3,330
Surveying and Mapping Technicians	2,360
Surveying and Mapping Scientists	1,560
Landscape Architects	1,330
Architecture Teachers, Postsecondary	150

How fast will employment grow?

Between 1998 and 2008, the number of jobs is expected to grow by nearly 10 percent, about as fast as the projected average rate of 12.5 percent for all occupations in the state. The fastest-growing occupation will be surveying and mapping technicians, which will grow at 22 percent. Other occupations that will grow faster than average are architects and postsecondary architecture teachers.

Architecture and Drafting Occupations Ranked by Job Growth Rate, 1998-2008

Occupation	Job Growth Rate
Surveying and Mapping Technicians	22.0%
Architects, Except Landscape and Marine	20.7%
Architecture Teachers, Postsecondary	20.0%
Landscape Architects	13.5%
Drafters	5.2%
Surveying and Mapping Scientists	1.9%

How many job openings are expected?

Occupations in the Architecture and Drafting career field will generate nearly 6,700 job openings between 1998 and 2008, including more than 2,000 new jobs. The remaining openings will be replacements for current workers.

The occupation of drafters is expected to provide the most openings over the decade with 3,610 total job openings. The occupation of architects will provide nearly 1,200 openings, and surveying and mapping technicians, 1,050 openings.

Architecture and Drafting Occupations Ranked by Total Job Openings, 1998-2008

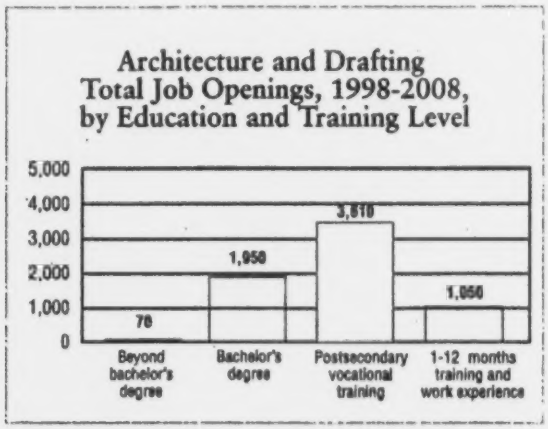
Occupation	Total Job Openings
Drafters	3,610
Architects, Except Landscape and Marine	1,190
Surveying and Mapping Technicians	1,050
Landscape Architects	380
Surveying and Mapping Scientists	380
Architecture Teachers, Postsecondary	70

What education and training are required?

More than 2,000 of the job openings expected over the 1998-2008 decade will require at least a bachelor's degree. The largest occupation is for architects, with 1,190 openings. The occupation of drafters, with 3,610 openings, requires postsecondary vocational training. About 1,050 openings, for surveying and mapping technicians, require one to 12 months of training and work experience.

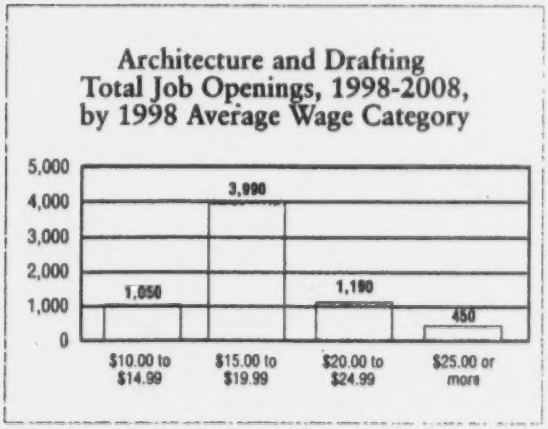
How much do the jobs pay?

The largest number of job openings in the Architecture and Drafting career field will be in occupations with average hourly wages of $15 to $19.99 in 1998. The large majority of the 3,990 openings are for drafters, with the remainder for surveying and mapping scientists.



There will be an additional 1,190 openings for the occupation of architects, which had 1998 average hourly wages in the $20 to $24.99 range. The occupation of surveying and mapping technicians, with 1,050 openings, had 1998 average hourly wages of $10 to $14.99.

The occupation of landscape architects is expected to generate about 380 job openings with average hourly wages of more than $25 in 1998. Seventy job openings for postsecondary architecture teachers are also in this higher wage category.



Where are the jobs?

Most jobs in the Architecture and Drafting career field are found in businesses that provide engineering and architectural services. Many landscape architects work in businesses that provide landscape and horticultural services. Many architects and landscape architects are self-employed.

Where can I find more information?

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Center for Curriculum & Assessment

For more information and technical assistance contact the
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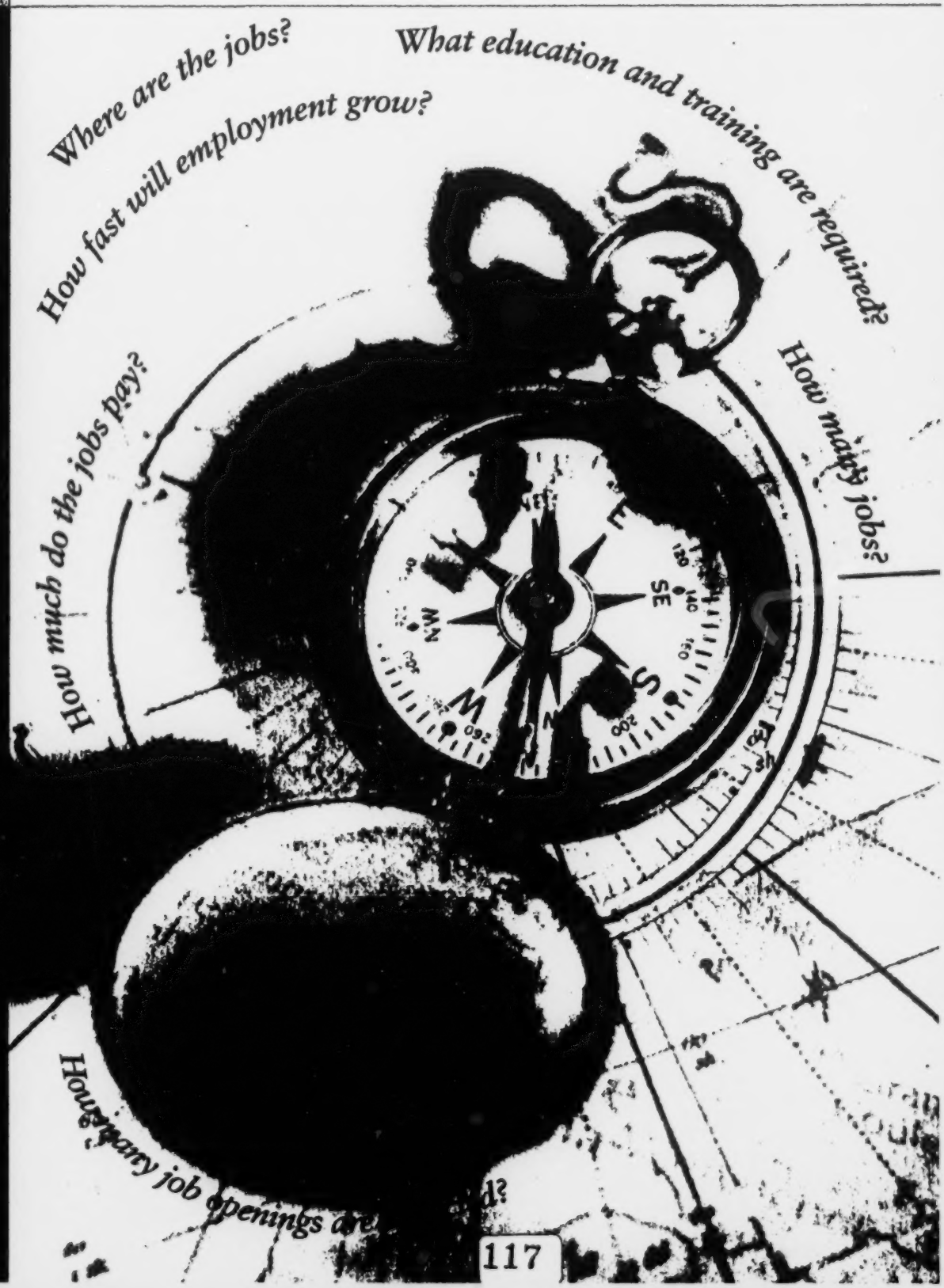
Construction Careers


Where are the jobs?
What education and training are required?
How fast will employment grow?
How much do the jobs pay?
How many jobs?
How many job openings are

Construction Careers

The Construction career field includes careers as construction managers, inspectors, supervisors, construction trades workers, and helpers. This is one of several Industrial and Engineering career fields.

How many jobs?

In 1998, there were about 295,700 jobs in Ohio in the Construction career field. The 10 largest occupations range from more than 36,600 jobs for carpenters to 9,150 jobs for sheet metal workers.

Ten Largest Construction Occupations

	Occupation	1998 Employment
1.	Carpenters	36,630
2.	Electricians	30,640
3.	Industrial Truck and Tractor Operators	24,330
4.	Plumbers, Pipefitters and Steamfitters	19,290
5.	Painters and Paperhangers	17,340
6.	First-Line Supervisors of Construction and Extractive Workers	16,650
7.	Highway Maintenance Workers	10,570
8.	Construction Managers	9,510
9.	All Other First-Line Supervisors	9,420
10.	Sheet Metal Workers	9,150

How fast will employment grow?

Between 1998 and 2008, the number of jobs in the Construction career field is expected to grow by 14.4 percent, near the average rate of 12.5 percent for all occupations in the state.

The 10 fastest-growing occupations in the Construction career field include three occupations with job growth at about twice the average rate: sheet metal duct installers, plasterers and stucco masons, and stone masons. The remaining fastest-growing occupations are expected to grow at above average rates.

Ten Fastest-Growing Construction Occupations, 1998-2008

	Occupation	Job Growth Rate
1.	Sheet Metal Duct Installers	26.0%
2.	Plasterers and Stucco Masons	21.3%
3.	Stone Masons	21.1%
4.	Hazardous Materials Removal Workers	20.1%
5.	Brick Masons	20.0%
6.	Roofers Helpers	18.9%
7.	All Other Construction and Extractive Workers	17.2%
8.	Elevator Installers and Repairers	17.0%
9.	Fence Erectors	16.9%
10.	Construction Managers	15.7%

How many job openings are expected?

Occupations in the Construction career field will generate more than 98,000 job openings over the decade. These job openings will result in part from the creation of about 43,000 new jobs. The remaining openings will be replacements for current workers.

Fast growth rates do not necessarily indicate a large number of job openings. Altogether, the 10 fastest-growing occupations account for only 11 percent of the job openings expected over the decade in the Construction career field.

The 10 occupations expected to have the most job openings will provide a total of 57,610 openings, or 59 percent of all openings expected.

The occupation expected to have the most openings is carpenters, with 13,670 jobs.

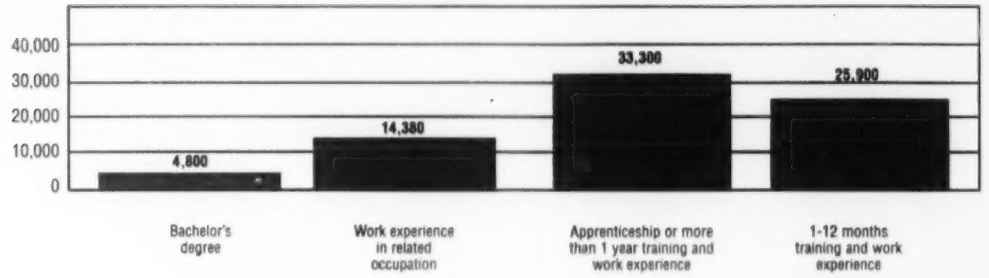
Ten Construction Occupations with the Most Job Openings, 1998-2008

	Occupation	Total Job Openings
1.	Carpenters	13,670
2.	Electricians	8,090
3.	First-Line Supervisors of Construction and Extractive Workers	6,640
4.	Painters and Paperhangers	6,100
5.	Industrial Truck and Tractor Operators	5,480
6.	Carpenters Helpers and Related Workers	4,430
7.	All Other First-Line Supervisors	3,670
8.	Highway Maintenance Workers	3,300
9.	Construction Managers	3,160
10.	Sheet Metal Workers	3,070

What education and training are required?

Occupations in the Construction career field require various education and training levels. The largest number of openings is 33,300 for occupations requiring an apprenticeship or more than one year of training and work experience. These openings are primarily for carpenters, electricians, brick masons, plumbers, and other trades.

Construction Total Job Openings, 1998-2008, by Education and Training Levels



Occupations requiring one to 12 months of training and work experience will provide 25,900 openings, with the largest share of the openings for painters and paperhangers, sheet metal workers, and roofers.

There will be 4,800 job openings for two occupations requiring a bachelor's degree: construction managers and cost estimators.

Occupations requiring work experience in related occupations will provide about 14,380 openings over the decade. These openings are for construction supervisors and inspectors.

There will also be large numbers of openings in occupations requiring only brief training. Most of these openings will be for industrial truck and tractor operators, carpenters helpers, and highway maintenance workers.

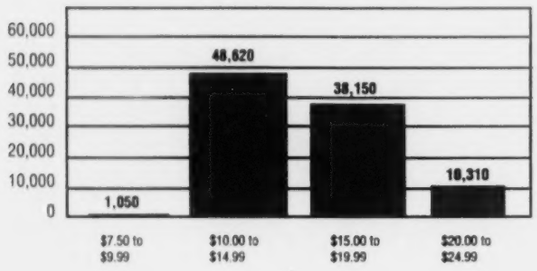
How much do the jobs pay?

The largest number of job openings in the Construction career field will be in occupations with average wages of $10 to $14.99 per hour in 1998. Most of these 48,620 openings are for carpenters, painters and paperhangers, industrial truck and tractor operators, highway maintenance workers, and carpenters helpers.

An additional 38,150 openings are expected in occupations with average hourly wages of $15 to $19.99 in 1998. Most of these openings are for electricians, first-line supervisors, sheet metal workers, brick masons, and plumbers.

Among occupations with 1998 average hourly wages of $20 to $24.99, about 10,300 openings are expected, primarily for construction managers and supervisors.

Construction
Total Job Openings, 1998-2008,
by 1998 Average Wage Category



Where are the jobs?

Most jobs in the Construction career field are found in:

General Building Contractors — businesses that build houses, industrial buildings, warehouses, and commercial and other nonindustrial buildings.

General Contractors, Excluding Building — businesses that build highways, bridges, pipelines and powerlines, and do other heavy construction.

Special Trade Contractors — businesses that do plumbing, heating and air conditioning, electrical work, masonry, and other special trades.

Where can I find more information?

Ohio's labor market information system at **lmi.state.oh.us** and the Occupational Outlook Handbook at **stats.bls.gov/ocohome.htm** are sources of additional information and links to Ohio and national job banks, career and occupational resources, and education and training opportunities.

Check the Web site at **www.ode.state.oh.us/ctae** for more details about this and other career fields.

Construction Careers

Data sources

Employment and wage information are from the Ohio Department of Job and Family Services, Bureau of Labor Market Information.

Education and training levels, from the U.S. Bureau of Labor Statistics, are described as:

Beyond bachelor's degree — This category includes professional, doctoral and master's degrees. Completion of academic programs leading to first professional degrees usually requires at least six years of full-time equivalent academic study, including college study prior to entering the professional degree program. Completion of doctoral degrees usually requires at least three years of full-time equivalent academic work beyond the bachelor's degree. Master's degrees usually require one or two years of full-time equivalent study beyond the bachelor's degree.

Work experience, plus a bachelor's or higher degree — Most occupations in this category are managerial occupations that require experience in a related nonmanagerial position.

Bachelor's degree — Completion of the degree program generally requires at least four years but not more than five years of full-time equivalent academic work.

Associate degree — Completion of the degree program usually requires at least two years of full-time equivalent academic study.

Postsecondary vocational training — Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.

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